

The University of Chicago

AN EVALUATION OF SCHOLARSHIP
AND CHARACTER OF COLLEGE
STUDENTS

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE DIVISION OF THE
SOCIAL SCIENCES IN CANDIDACY FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATION

1941

By

THEODORE PIERSON STEPHENS

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NOTE

This publication reproduces all of the dissertation except Appendix II, consisting of tables of the scores of individual students. The complete dissertation is to be found in the University of Chicago Libraries.



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CHAPTER I

INTRODUCTION

The evaluation of the achievement of college students presents an important and complex educational problem. Teachers' course marks and marks in essay examinations have been the chief criteria for many years. In more recent years numerous investigations have thrown doubt on the reliability of such marks and have emphasized the desirability of more reliable measurement.^{1,2}

The invention of the new objective type examination has made possible the development of more reliable testing instruments. These testing techniques permit a larger sampling of the student's knowledge in a given time than does the typical essay examination, and the scoring is freed from the instructor's bias. Such objective tests can be standardized by giving them to a large number of college students and norms for large student populations can be determined. Then it becomes possible to compare the achievement of students in a given college with the performance of a nationally representative group of students. Moreover, since the objective type of examination lends itself to statistical treatment that facilitates the construction of comparable forms of examinations, it becomes possible to test the same students more than once and thus obtain a measure of progress.

The Pennsylvania Study begun in 1925 by the Carnegie Foundation for the Advancement of Teaching and carried on for thirteen years at a cost of \$3,000,000 demonstrated some of the possibilities of such an approach to testing on the college level. During that period, nearly 55,000 individuals were tested, 3,000

¹John Emlin Bohan, Students' Marks in College Courses. Minneapolis: University of Minnesota Press, 1931. Pp. xiii + 133.

²Conference on Examinations. Proceedings of the Conference on Examinations held at Eastbourne, 1931. Edited by Paul Monroe. New York: Bureau of Publications, Teachers College, Columbia University, 1931. Pp. 316.

of them more than once by the same tests.¹ The proponents of the study believed that such testings could serve the college student in a twofold manner:

1. As evidence of the extent to which his intellectual equipment is accumulating.

2. As a survey of the still unmastered material in the field. Testing then becomes self-revelation.²

It was recognized that the desirable goals of higher education include more than the knowledge elements, largely factual, the recall of which the examinations measured. However, the directors of the study argued that the desired "intangibles" are not readily measurable and that the objective examinations did offer tools of measurement with a high degree of reliability in the "knowledge" area. They assumed, too, that a high degree of correlation probably existed between the type of achievement measured by the test and achievement of the "intangibles."³

References to specific findings of the Pennsylvania Study will be made at suitable points in the present volume. Mention is made of it in this chapter because it was a pioneer project in repeated comparable testing on the college level.

On January 31, 1931, at a meeting of the Central Committee on Personnel Methods of the American Council on Education, the Advisory Committee on College Testing was created to carry out a co-operative testing project.^{4,5} The Co-operative Test Service thus set up has made available annual comparable forms of examinations in many of the fundamental subject matters of the Junior college. It was also intended that some of these examinations would be used for testing on the higher college levels.

In May, 1932, selected portions of tests which had been used in the Pennsylvania Study were administered in 140 colleges.⁶

¹William S. Learned and Ben D. Wood, The Student and His Knowledge. New York: The Carnegie Foundation for the Advancement of Teaching, 1938. Pp. xx + 406.

²Ibid., p. 54.

³Ibid., p. 60.

⁴H. E. Hawkes, "The Co-operative Test Service," Educational Record, XII (January, 1931), 30-38.

⁵Ben D. Wood, "The Co-operative Test Service," Educational Record, XII (July, 1931), 244-252.

⁶"The 1932 College Sophomore Testing Program," Educational Record, XII (October, 1932), 290-343.

Beginning with the year 1933, special examinations prepared by experts in test construction with the co-operation of authorities in each of the fields to be tested have been made available annually.^{1,2} Norms for the tests given each year, together with analyses and interpretations have been published either in the October issues of the Educational Record for the respective years or in supplementary bulletins.^{3,4} The norms of performance of college students are based on groups of testees of varying number up to 50,000 students in 90 colleges for the English tests.

Most colleges which have used the tests seem to have given them only to Sophomores in May of each year. Some colleges have used them at other levels as well. A very few institutions have used comparable forms of these tests on all four levels year by year.

The study reported in this volume had its origin in the desire of the investigator to study the achievement of college students in respect to certain points which have not been treated adequately in other reported investigations. If identical students were tested year by year with comparable forms of reliable tests in certain areas of knowledge, would they register progress? If so, to what degree would that progress be determined by their scholastic aptitude? How closely would high scores in such tests be related to college courses taken in the field of knowledge sampled by the tests?

Repeated testing of the same students by means of the examinations of the Co-operative Test Service seemed to be a procedure that might yield the answer to these questions. It was recognized that the tests suffered certain limitations for such a program.

In the first place, they were not planned to measure the

¹The Co-operative Achievement Tests; A Handbook, p. 4. New York: The Co-operative Test Service of the American Council on Education, 1936.

²Max McConn, "Educational Guidance Is Now Possible," Educational Record, XIV (October, 1932), 475-499.

³Tables for the Conversion of Raw Scores to Scaled Scores. New York: The Co-operative Test Service of the American Council on Education.

⁴A Booklet of Norms. New York: The Co-operative Test Service of the American Council on Education, 1938. Pp. 85.

particular course objectives of instruction in any one college. The opinion of the test designers concerning the importance of items or even areas of knowledge might well be very different from that of instructors. The students' efforts might be directed toward the mastery of other important knowledge to the neglect of that called for in the examination.

In the second place, the tests measured chiefly the recall of factual items rather than the more important and more enduring abilities to arrive at sound judgments, to deduce principles from data, to apply principles in new situations. Yet a capable instructor would make these his primary concern.

In the third place, the tests made no attempt to measure any of the non-intellectual "intangibles" which are important desired outcomes of the college experience.

Notwithstanding these limitations, at the time the present investigation was begun, the co-operative tests were considered the most reliable and the most valid tests available for an investigation seeking to answer the questions raised above. Therefore, co-operative test scores in four colleges were studied for such evidence as they might yield concerning scholastic achievement.

Other questions that had not been answered in other studies to the satisfaction of this investigator were concerned with character. Is it possible to measure character in college? If so, what relationship is there between character and scholastic aptitude or between character and intellectual achievement as measured by the co-operative tests? To answer such questions, a Character Rating Scale was devised and used to measure students in one college.

The study being reported differs, then, from other investigations of college achievement first, in the fact that it is concerned with the repeated testing of identical students in an effort to measure progress rather than status alone; second, in that it endeavors to measure character; and third, in that it seeks to discover the relationship between the test scores and character ratings and certain other factors.

Specifically this study analyzes:

1. The change in scores made by students in four colleges from Freshman year to Senior year on the co-operative tests in English usage, vocabulary, spelling, literary acquaintance, his-

tory and social science, foreign literature, fine arts, public affairs and aesthetics.

2. The relationship between scholastic aptitude and scores on these tests for students in four colleges.

3. The relationship between college courses taken and scores on corresponding tests for students in four colleges.

4. The relationship between the achievement of character objectives and test scores in one college.

5. Certain other factors that affect scholastic achievement as revealed by a study of individual students in one college.

One chapter will be devoted to a discussion of the data and the methods of procedure, one chapter to each of the points listed above, and one chapter to a summary of the findings and the suggestion of certain implications arising from them.

CHAPTER II

THE DATA AND THE METHODS OF PROCEDURE

Co-operative achievement test scores, college courses taken, and college marks, scores on psychological aptitude tests, and the professional goals of 1,300 students from four liberal arts colleges were made available by the registrars of the following colleges:

Aurora College, Aurora, Illinois
Georgian Court College, Lakewood, New Jersey
Marywood College, Marywood, Pennsylvania
College of St. Catherine, St. Paul, Minnesota

At the time this study was initiated these were the only liberal arts colleges in the country, according to the records of the Co-operative Test Service, that had made any extensive use of the co-operative tests on all four class levels for a period of four years. For each of these 1,300 students there are at least two tests in the same subjects taken a year apart. For each of 377 students there are tests for four years in one or more subjects. The test scores reported for Aurora College are for tests administered in the years 1934 to 1940 inclusive. The scores reported for the other three colleges are for tests administered in the years 1933 to 1938 inclusive.

The data were entered upon individual record cards for each student. The raw scores on the tests were equated to 1936 raw scores or were converted to scaled scores and thus brought into comparable form for the study with the aid of equating tables and publications of the Co-operative Test Service.

The scaled score is a form of standard score devised by John C. Flanagan of the Co-operative Test Service to facilitate comparability of test scores between subjects and forms. The units for all forms and all tests under certain conditions are similar in size and equal in value throughout the scale. The procedure followed in devising the scaled score is explained in

Dr. Flanagan's monograph, Scaled Scores.¹ For all tests for which scaled scores were available they have been used in reporting this investigation. For other tests equated raw scores have been used. In presenting data graphically in some figures, percentile ranks have been given as well. These percentiles have been taken from tables furnished by the Co-operative Test Service and represent the norms of performance in May of the Sophomore year by students in liberal arts colleges which participated in the program.

The investigator made tabulations of the scores for each section of each test for the group of four colleges, for each college, and for each quarter of the group within each college as distributed by the psychological test. Changes in score for each subject were recorded for each student; measures of central tendency and of dispersion and various correlation coefficients were computed. The relation of the curriculum followed to achievement in tests was studied with the aid of the data furnished by the co-operating colleges.

In the present report, the data given concern chiefly the performance of the 377 students for whom four continuous years of testing records are available in at least one test. The records of the other 900 students for whom there are only two or three years of test scores are used only occasionally as a check on the performance of the smaller group.

In one college, Aurora, the faculty gave deliberate consideration to the formulation of objectives sought under the general category of character. A study of existing rating scales and the literature by a committee followed by faculty discussion and action resulted in the creation of a Character Rating Chart which was used in scoring students for whom four years of test scores were available. The nature of this chart and the part it played in this study is described in detail in Chapter VI. Eight members of the faculty rated 87 Seniors and recent graduates. Average scores were found, and these were compared for correlation with the test scores of the Senior year and also with the

¹John C. Flanagan, Scaled Scores. New York: The Co-operative Test Service of the American Council on Education, 1939. Pp. v + 42.

progress made in test scores through four years. They were also compared for correlation with scholastic aptitude scores.

This was followed by individual consideration of each of the 87 students in an attempt to detect some of the other factors that affected achievement.

On the basis of all these investigations, certain conclusions were reached which are reported in Chapter VIII.

CHAPTER III

THE PROGRESS OF COLLEGE STUDENTS IN CERTAIN AREAS OF GENERAL EDUCATION AS MEASURED BY OBJECTIVE TESTS

This chapter reports the changes in scores on comparable forms of certain co-operative tests taken by students in four colleges in May of each of the four college years. By repeated testing of the same students, it is possible to discover their progress, as measured by the tests, rather than just their status at any one time. For each test the results will be presented both in tables and graphically in a figure.

English

The Co-operative Test in English including sections on Usage, Vocabulary and Spelling was administered in Colleges A, B, and D in May of the Freshman, Sophomore, Junior and Senior years. The form of the test released by the Co-operative Test Service each spring was used in the respective calendar years. That is, in May of 1935, the 1935 form was used by all the colleges. In College A this test was also used during Freshman week to test entering students. The form of the test released the preceding spring was given. The raw scores for all forms of the test have been converted to scaled scores and the mean changes by years are reported in Table 1. The reliability coefficient reported by the Co-operative Test Service for the 1937 form of the test is .985.¹

Table 1 should be read as follows. When the scores on the total English test for 197 students in Colleges A, B, and D are consolidated, the average scaled score at the beginning of the testing program in May of the Freshman year is 58.4 with a standard deviation of 5.1. The mean scaled score for these same

¹A Booklet of Norms. New York: The Co-operative Test Service of the American Council on Education, 1938. Pp. 85.

TABLE 1

MEAN CHANGES IN SCALED SCORES ON TOTAL CO-OPERATIVE
ENGLISH TEST FOR 197 STUDENTS OF
COLLEGES A, B, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,C	197	Fresh.	58.4	5.1			
A,B,C	197	Soph.	61.6	4.8	3.2±0.15	59	
A,B,C	197	Jr.	62.7	3.9	1.1± .14	34	
A,B,C	197	Sr.	64.5	4.5	1.8± .13	38	79
A	59	Fresh.	57.4	8.4			
A	59	Soph.	59.7	4.4	2.3± .25	47	
A	59	Jr.	61.2	4.3	1.5± .24	42	
A	59	Sr.	63.4	4.2	2.2± .20	37	81
B	120	Fresh.	58.3	8.4			
B	120	Soph.	61.9	4.9	3.6± .34	63	
B	120	Jr.	62.4	4.1	0.5± .17	29	
B	120	Sr.	64.6	3.9	2.2± .15	41	81
D	18	Fresh.	62.2	7.1			
D	18	Soph.	66.2	4.5	4.0± .60	75	
D	18	Jr.	68.2	5.1	2.0± .54	43	
D	18	Sr.	65.8	6.1	-2.4± .36	18	58

students in May of the Sophomore year is 61.6 with a standard deviation of 4.8. The gain in score is 3.2 and the probable error of the difference of the means is .15. The formula used for calculating this probable error is $PE_{M1-M2} = \sqrt{(PE_{M1})^2 + (PE_{M2})^2 - 2r_{12} \cdot PE_{M1} \cdot PE_{M2}}$ in which PE_{M1} and PE_{M2} equal the probable error of the mean of the respective distributions and r is the product moment correlation coefficient between the two sets of scores. Table 1 shows that 59 per cent of the students make a significant gain in score in the Sophomore year. The standard error of measurement for this test reported by the Co-operative Test Service is 1.22.¹ Only students making gains of at least two and one-half times this error are reported as having gained significantly. In the last column to the right in the table, the percentage of students

¹Ibid., p. 10.

making significant gains for the three-year period is reported. Seventy-nine per cent of the 197 students make a score in May of the Senior year that is significantly higher than the score in May of the Freshman year. Table 1 also reports the changes in score for students when grouped by individual colleges.

Table 1 reveals a slight but a statistically significant gain for each group of students in each year except in the Senior year in College D. The mean gain of 6.1 from May of the Freshman year to May of the Senior year for 197 students may be compared to 4.2 which represents the difference between the mean of the scores in the Freshman year and the mean of the scores in the Senior year as reported by the Co-operative Test Service in norms based on 50,000 students in 90 colleges. These norms are based on cross-section testing of Freshmen and Seniors in these colleges rather than upon repeated testing of the same students, and, therefore, are not strictly comparable to the results reported in the present study. The comparison does indicate, however, that the students in Colleges A and B probably gain about 50 per cent more in score than the national group and that the students in College D gain slightly less than the national group.

When the scores of the three colleges are consolidated, the largest gain is recorded in the Sophomore year and the smallest in the Junior year. This is true of students in Colleges A and B when those groups are taken separately. In College D, however, an actual loss is recorded in the Senior year.

In College A this English test was also administered during Freshman week. This additional testing makes it possible to report the gains made in the Freshman year for 43 of the 59 students of College A listed in Table 1. These students with an initial mean score of 55.5, gained 3.1 during the Freshman year. Sixty per cent of these students made a statistically significant gain during the year. If this gain made by these 43 students is typical of all 59 students whose record is given in Table 1, then the mean gain in score for students in College A is $3.1 + 2.3 + 1.5 + 2.2$ or 9.1 scaled score units for the four years of college.

This picture of slight steady gain in score throughout the college experience does not tell the whole story. Averaging obscures some of the facts. In some years, over half of the students register no statistically significant gains. Because some

students who lose in one year gain in another, the percentage of students showing gains for the entire period of three years is apt to be higher than for any individual year.

The scores tend to cluster more closely around the mean as the test is given in successive college years. This is shown by the sigmas reported in Table 1 and by the range of scores reported in Table 2. This might be expected of test scores in a subject such as English expression in which a certain minimum of competence is sought.

TABLE 2

THE RANGE OF SCALED SCORES MADE BY 197 STUDENTS
OF COLLEGES A,B,D ON TOTAL CO-OPERATIVE
ENGLISH TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	34	77	43	51	77	26
B	41	81	40	44	83	39
D	45	73	28	54	79	25

The maximum possible raw score on this test is 285. A raw score of 266 or higher is equivalent to a scaled score of 99. The mean scores reported in Table 1, or even the extreme scores reported in Table 2, do not appear to be high enough to explain the small gains in the Junior or Senior years on the ground that the ceiling of the test had been reached by any large number of students.

Figure 1 sets forth the test records graphically. The scale to the left of the figure gives the National Sophomore Percentile Rank as reported by the Co-operative Test Service. The scale just inside the left edge of the graph gives the mean scaled scores on the total English test. The points in the drawn lines represent the mean scores made in the designated years. The broken line for the Freshman year for College A gives the performance of those 43 students for whom the extra year of tests was available.

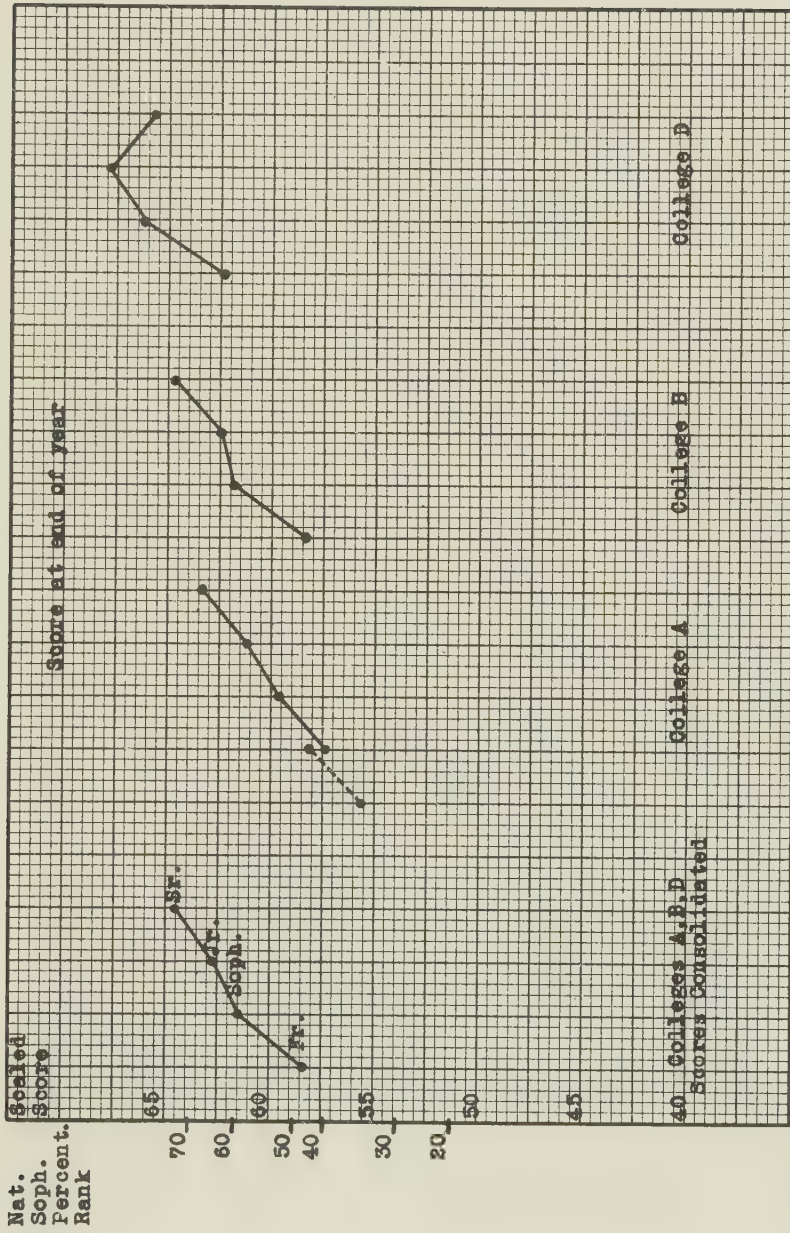


Fig. 1.--Changes in total English scaled score means

The extent to which the 197 students whose performance is reported in Table 1 and in Figure 1 hold their place in the group from Freshman to Senior year is indicated by a product moment correlation of $.79 \pm .01$ between equated raw scores in May of the Freshman year and in May of the Senior year.

Tables 3, 5, and 7 and Figures 2, 3, and 4 give the changes in mean scaled scores on the usage, spelling and vocabulary sections of the English test. Because in the 1940 form of the test the sections were not all strictly comparable with the earlier forms, the number of students for whom comparable section scores is available is reduced from 197 to 182.

TABLE 3
MEAN CHANGES IN SCALED SCORES ON ENGLISH USAGE SECTION
OF CO-OPERATIVE ENGLISH TEST FOR 182 STUDENTS
OF COLLEGES A, B, D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,D	182	Fresh.	57.8	8.6			
A,B,D	182	Soph.	61.1	6.4	3.3 ± 0.31	35	
A,B,D	182	Jr.	61.6	6.0	$0.5 \pm .23$	16	
A,B,D	182	Sr.	62.4	6.4	$0.8 \pm .23$	19	46
A	44	Fresh.	57.9				
A	44	Soph.	60.2	8.7	$2.3 \pm .67$	32	
A	44	Jr.	60.4	4.3	$0.2 \pm .61$	9	
A	44	Sr.	62.0	7.2	$1.6 \pm .52$	14	41
B	120	Fresh.	57.4	8.7			
B	120	Soph.	60.4	6.5	$3.0 \pm .38$	32	
B	120	Jr.	61.3	6.4	$0.9 \pm .31$	19	
B	120	Sr.	63.3	5.5	$2.0 \pm .29$	22	53
D	18	Fresh.	61.8	7.4			
D	18	Soph.	68.5	4.8	$6.7 \pm .85$	55	
D	18	Jr.	66.5	7.3	$-2.0 \pm .83$	11	
D	18	Sr.	61.8	7.0	-4.7 ± 0.88	11	11

Table 3 reports the changes in usage scores and shows substantial gain in score in the Sophomore year and very small gain or even loss in the Junior year. College D shows a loss in both Junior and Senior year. Some of the changes in score can hardly be considered significant in that they are not four times

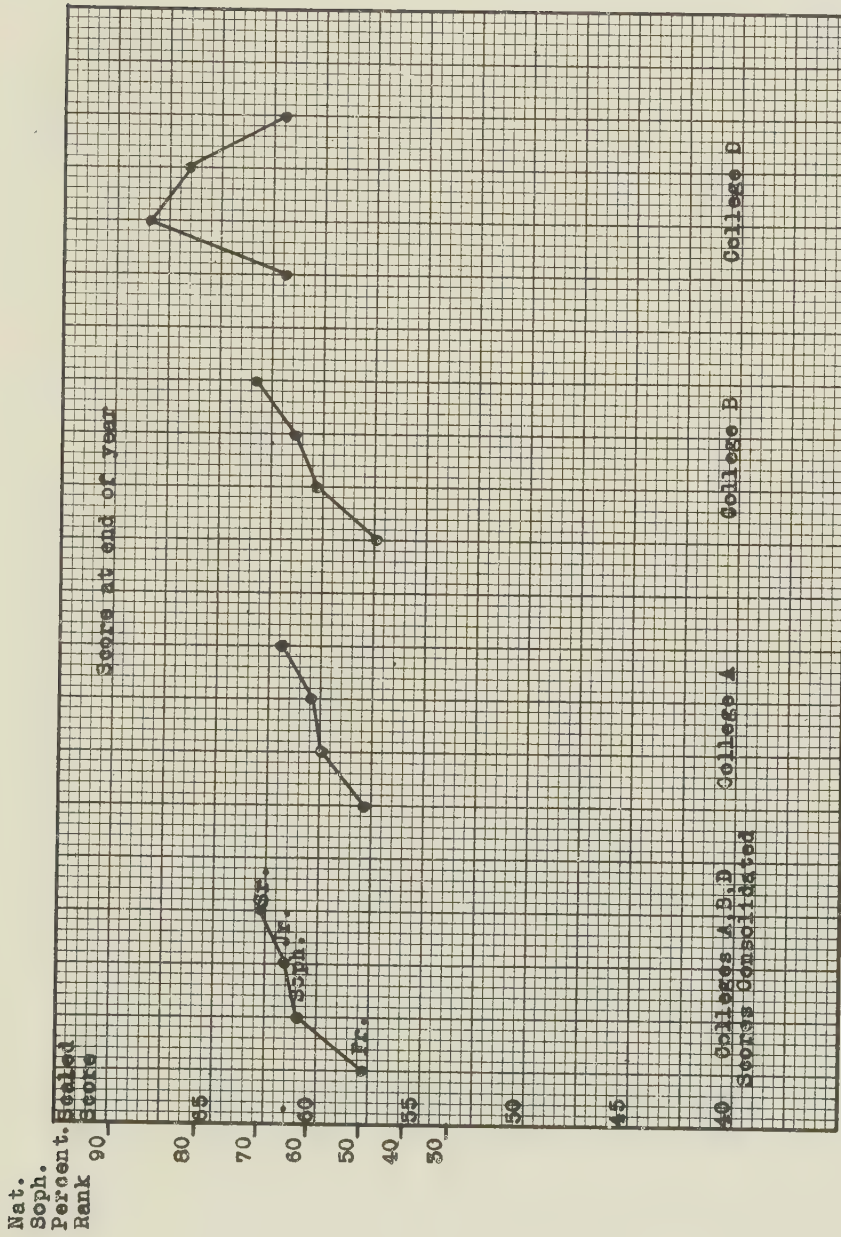


Fig. 2.--Changes in English Usage scaled score means

the probable error of the difference of the means. In computing the percentage of students gaining in any period, only those students gaining at least as much as two and one half times the standard error of measurement of 2.07^1 were included.

Table 4 giving the range, and the size of the standard deviations listed in Table 3 show no such clear tendency to reduce the range of scores on this section of the test in successive years as was shown by the whole test. The maximum possible scaled score on this section is 100. Again the size of the means reported in Table 3 and even the extreme scores in Table 4 do not seem to indicate that the ceiling of the test has been reached. The correlation between Freshman and Senior scores is $.68 \pm .02$. The reliability of this section of the test as reported by the Co-operative Test Service is .957.

TABLE 4
THE RANGE OF SCALED SCORES MADE BY 182 STUDENTS
ON USAGE SECTION OF CO-OPERATIVE ENGLISH TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	25	72	47	39	81	42
B	25	81	56	32	83	51
D	52	71	19	53	83	30

In Table 5 the data for changes in scores on the spelling section of the English test are given. The standard error of measurement for this section of the test is reported by the Co-operative Test Service² as 1.91. Students whose scores increased by at least 5 are reported as gaining.

The maximum possible scaled score on this test is 83.

¹Ibid., p. 10.

²Ibid.

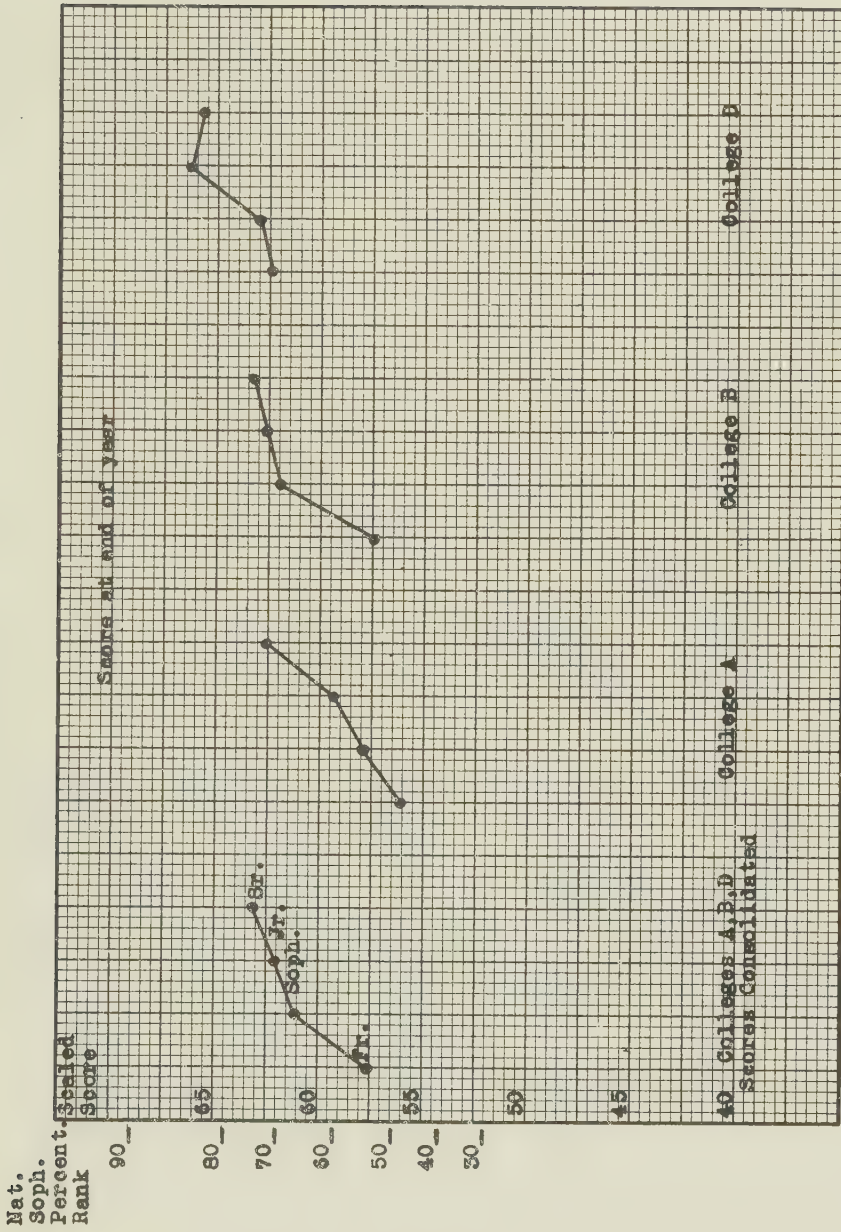


Fig. 3.--Changes in Spelling scaled score means

TABLE 5

MEAN CHANGES IN SCALED SCORES ON SPELLING SECTION OF
CO-OPERATIVE ENGLISH TEST FOR 182 STUDENTS OF
COLLEGES A, B, D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,D	182	Fresh.	57.5	9.1			
A,B,D	182	Soph.	61.0	6.4	3.5±0.31	42	
A,B,D	182	Jr.	62.0	5.8	1.0± .23	23	
A,B,D	182	Sr.	63.2	6.1	1.2± .23	27	58
A	44	Fresh.	56.0	5.4			
A	44	Soph.	58.0	5.6	2.0± .42	36	
A	44	Jr.	59.3	6.4	1.3± .47	20	
A	44	Sr.	62.5	6.2	3.2± .48	39	64
B	120	Fresh.	57.4	9.3			
B	120	Soph.	62.0	6.1	4.6± .41	47	
B	120	Jr.	62.5	5.6	0.5± .27	23	
B	120	Sr.	63.3	5.8	0.8± .26	24	60
D	18	Fresh.	62.3	5.6			
D	18	Soph.	63.0	6.0	0.7± .72	22	
D	18	Jr.	66.3	6.4	3.3± .75	28	
D	18	Sr.	65.6	7.1	-0.7±0.70	17	28

Table 6 gives the range of scores. It seems that on this section of the test the students with the highest scores do reach the ceiling of the test in the Senior year and very nearly so in the Freshman year.

The correlation between Freshman and Senior scores is .71±.02. The reliability of this section of the test as reported by the Co-operative Test Service is .964.

TABLE 6

THE RANGE OF SCALED SCORES MADE BY 182 STUDENTS ON
SPELLING SECTION OF CO-OPERATIVE ENGLISH TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	25	72	47	39	81	42
B	25	81	56	32	83	51
D	52	71	19	53	83	30

In Table 7 the changes in score for the vocabulary section of the test are given. The standard error of measurement

TABLE 7

MEAN CHANGES IN SCALED SCORES ON VOCABULARY SECTION
OF CO-OPERATIVE ENGLISH TEST FOR 182 STUDENTS
OF COLLEGES A, B, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,D	182	Fresh.	59.5	9.8			
A,B,D	182	Soph.	62.5	5.4	3.0±0.35	33	
A,B,D	182	Jr.	64.1	5.1	1.6± .19	25	
A,B,D	182	Sr.	66.7	5.4	2.6± .19	33	65
A	44	Fresh.	61.2	10.3			
A	44	Soph.	62.4	4.5	1.2± .78	23	
A	44	Jr.	66.1	4.8	3.7± .35	41	
A	44	Sr.	67.1	4.3	1.0± .35	20	64
B	120	Fresh.	57.7	8.5			
B	120	Soph.	60.5	4.5	2.8± .36	35	
B	120	Jr.	60.9	4.5	0.4± .21	17	
B	120	Sr.	64.3	4.5	3.4± .21	35	62
D	18	Fresh.	61.2	9.0			
D	18	Soph.	66.0	6.9	4.8± .99	44	
D	18	Jr.	70.0	6.3	4.0± .34	33	
D	18	Sr.	72.0	7.3	2.0± .82	33	82

reported for this section is 1.94.¹ Gains in score of 5 points or more are counted as significant in calculating the percentage of students gaining. In contrast to the record on the other sections of the test, College D shows a gain in all years. The maximum scaled score on this test is 100. The range of scores is given in Table 8.

The correlation between Freshman and Senior scores is .71±.02. The reliability of this section of the test is reported by the Co-operative Test Service as .962.

TABLE 8

THE RANGE OF SCALED SCORES MADE BY 182 STUDENTS ON
VOCABULARY SECTION OF CO-OPERATIVE ENGLISH TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	39	77	38	48	86	38
B	18	88	70	50	84	34
C	47	75	28	54	81	27

Literary Acquaintance

The Co-operative Literary Acquaintance Test is made up of 150 multiple choice items covering English literature presumably included in college courses in this field. The results of using this test on four class levels in three colleges are given in Table 9.

For this test, the reported standard error of measurement is 2.14.² Gains in score of 6 points or more have been considered significant in calculating the percentage of students gaining. Again the tendency for students to make a larger gain in score in the Sophomore than in either the Junior or Senior year is observed. When the consolidated scores are separated by colleges, this trend is not so evident.

¹ Ibid., p. 10.

² Ibid.

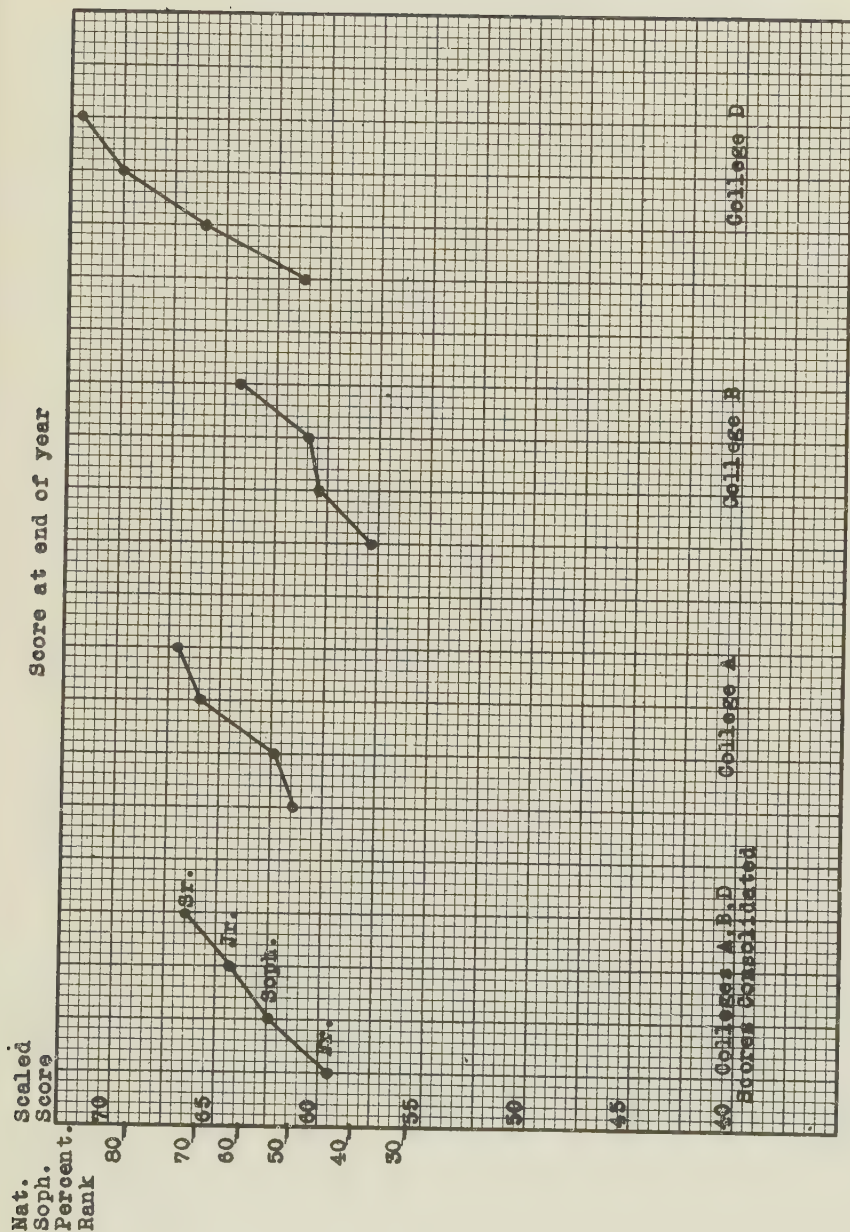


Fig. 4.--Changes in Vocabulary scaled score means

TABLE 9

MEAN CHANGES IN SCALED SCORES ON CO-OPERATIVE LITERARY
ACQUAINTANCE TEST FOR 157 STUDENTS IN
COLLEGES A, B, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,D	157	Fresh.	54.7	9.1			
A,B,D	157	Soph.	59.3	6.1	4.6±0.34	47	
A,B,D	157	Jr.	61.3	6.1	2.0±0.25	23	
A,B,D	157	Sr.	62.9	6.9	1.6±0.26	26	64
A	21	Fresh.	58.4	9.4			
A	21	Soph.	62.5	6.4	4.1±0.98	52	
A	21	Jr.	64.2	4.8	1.7±0.66	19	
A	21	Sr.	69.0	5.3	4.6±0.57	38	90
B	122	Fresh.	53.5	8.7			
B	122	Soph.	58.3	5.5	4.8±0.38	47	
B	122	Jr.	59.9	5.6	1.6±0.27	22	
B	122	Sr.	61.6	6.0	1.7±0.26	25	60
D	14	Fresh.	59.6	9.0			
D	14	Soph.	63.2	9.6	3.6±1.28	35	
D	14	Jr.	69.8	9.9	6.6±1.35	43	
D	14	Sr.	66.3	12.0	-3.5±1.57	14	50

The maximum possible scaled score on this test is 99. The range of scaled scores for the students tested is given in Table 10. The high score of 93 for a student in College D represents only 8 raw score units less than a perfect score. The size of the mean scores reported in Table 9, however, shows that few of the students approached the ceiling of the test.

The product moment correlation coefficient for the relationship between scores in May of the Freshman year and May of the Senior year of the 157 students is .71±.02. To that degree, students tend to hold their places as the whole group gains in score. The reliability coefficient reported for the test by the Co-operative Test Service is .954.

TABLE 10

THE RANGE OF SCALED SCORES MADE BY 157 STUDENTS
ON CO-OPERATIVE LITERARY ACQUAINTANCE TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	45	76	31	51	86	35
B	36	78	42	39	87	48
C	46	77	31	52	95	41

The average gain made by these 157 students of 8.2 scaled score units in the last three college years is about 50 per cent greater than the difference between Freshman and Senior scores reported in the Book of Norms¹ for 35,000 students in 70 colleges, although it must be remembered that that norm is based on cross section testing rather than continuous testing. The individual college groups show three year gains as follows: A, 10.6; B, 8.1; D, 6.7. Again, College D has the highest initial score and shows a marked loss in the Senior year. College A shows the largest gain in the Senior year.

Within the pattern of general gains, there is wide variation in individual performance. As in the scores of the other English tests reported earlier in this chapter, the percentage of students showing a net gain for the three year period is significantly larger than the percentage gaining in any one year.

General Culture

The Co-operative General Culture Test (Form 1937) is a three-hour test in three parts: Part I, History and Social Studies, consisting of 141 matching items and 132 multiple choice items; Part II, Foreign Literature, 295 multiple choice items; Part III, Fine Arts, 229 matching items. In later forms of this test sections on science and mathematics were added. There were not enough scores for these later forms of the test for the

¹Ibid., p. 46.

investigator to use; therefore, the scores will be reported for Parts I, II, and III only. All raw scores were equated by means of tables furnished by the Co-operative Test Service to scores on the 1936 form. The results are reported in the tables and figures which follow.

Table 11 gives the mean changes in raw scores for the section of the test covering history and social studies. The standard error of measurement reported for this test is 8.29. Gains of 20 points or more are counted as significant in computing the percentage of students gaining. The product moment correlation coefficient for the relationship of Freshman and Senior scores is $.79 \pm .01$. The reported reliability of this section of the test is .935. Again on this test the gains tend to be the largest in the Sophomore year and smallest in the Junior year.

TABLE 11

MEAN CHANGES IN RAW SCORES ON HISTORY AND SOCIAL STUDIES
SECTION OF CO-OPERATIVE GENERAL CULTURE TEST FOR
355 STUDENTS IN COLLEGES A, B, C, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,C,D	355	Fresh.	67.9	34.6			
A,B,C,D	355	Soph.	74.8	19.2	6.9 ± 0.79	22	
A,B,C,D	355	Jr.	78.5	17.7	3.7 ± 0.41	16	
A,B,C,D	355	Sr.	83.0	18.0	4.5 ± 0.39	19	39
A	61	Fresh.	80.4	38.9			
A	61	Soph.	84.8	18.5	4.4 ± 2.27	13	
A	61	Jr.	91.3	17.5	6.5 ± 0.96	23	
A	61	Sr.	97.6	15.5	6.3 ± 0.89	23	45
B	120	Fresh.	49.7	24.0			
B	120	Soph.	60.4	17.0	10.7 ± 0.87	30	
B	120	Jr.	64.3	17.7	3.9 ± 0.65	11	
B	120	Sr.	69.2	17.2	4.9 ± 0.66	16	40
C	136	Fresh.	81.4	33.0			
C	136	Soph.	86.4	18.0	5.0 ± 0.12	20	
C	136	Jr.	89.4	16.7	3.0 ± 0.62	12	
C	136	Sr.	93.5	16.5	4.1 ± 0.35	16	34
D	38	Fresh.	55.8	25.0			
D	38	Soph.	63.8	19.8	8.0 ± 1.6	24	
D	38	Jr.	67.4	18.3	3.6 ± 1.3	21	
D	38	Sr.	71.5	21.0	4.1 ± 1.3	29	42

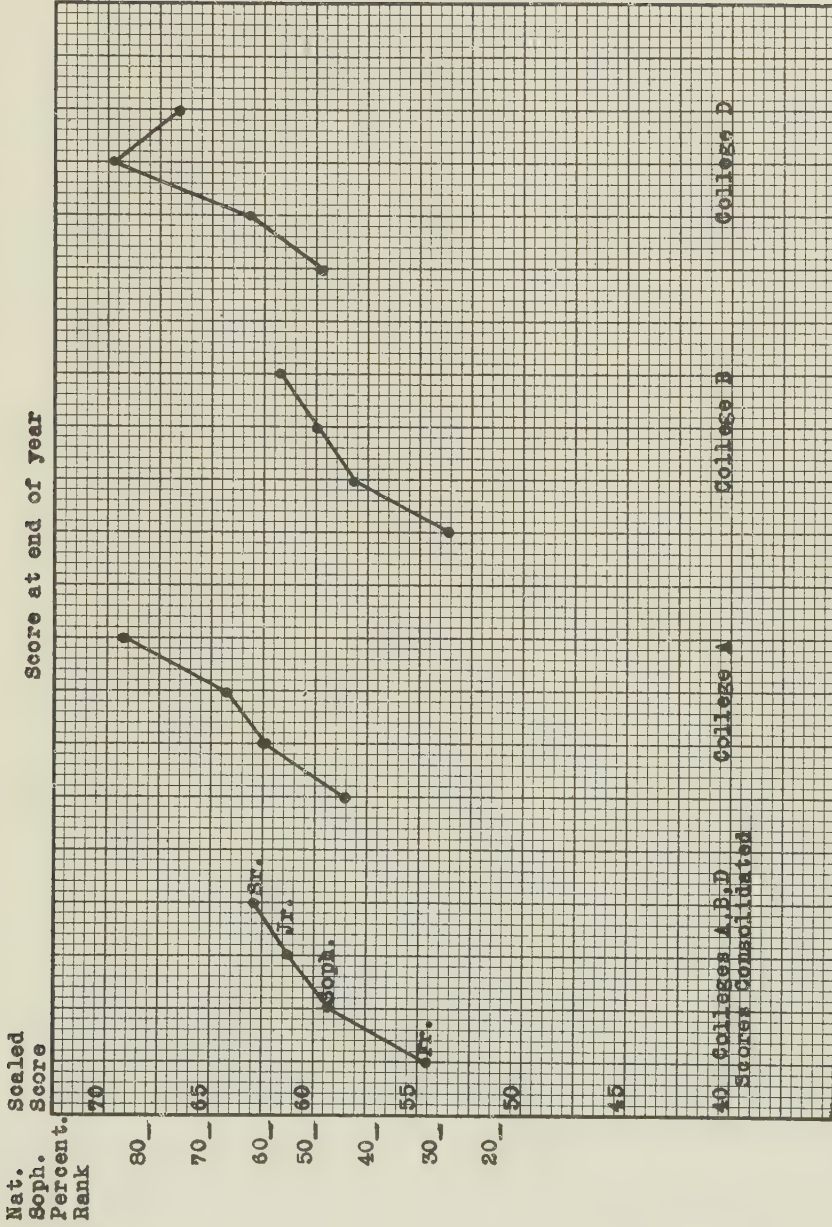


Fig. 5.--Changes in Literary Acquaintance scaled score means

The range of scores is given in Table 12. The maximum possible score is 273.

TABLE 12

THE RANGE OF EQUATED RAW SCORES MADE BY 355 STUDENTS ON
HISTORY AND SOCIAL STUDIES SECTION OF THE
CO-OPERATIVE GENERAL CULTURE TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	5	190	185	39	191	152
B	17	159	142	14	217	203
C	10	194	184	38	190	152
D	17	112	95	36	169	133

The graphs in Figure 6 reveal a gain in each college in each year. While there is some variation in the amount gained by the different groups, perhaps the most striking fact is the differences in the initial scores in May of the Freshman year. Despite the substantial gains made by the groups in Colleges B and D, the mean Senior score in these institutions is much below the Freshman score in Colleges A and C. However, 40 per cent of the students in College B make a net gain in the three-year period as compared with 34 per cent in College C.

When the scores are considered in relation to the national percentile ranks for end-of-year Sophomores, it is apparent that the mean score for College C students is about as far above the national median as the score of College B is below it. The consolidated Sophomore score for all four colleges is at the 53d national percentile rank.

The range of individual scores, as shown in Table 12, is much the lowest for College D in the Freshman year. In Colleges A and C the range of Senior scores is about 30 points less than in the Freshman year. In Colleges B and D it is over 70 points greater in the Senior year.

Table 13 gives the data in the same form for the foreign literature section of the test. The standard error of measurement

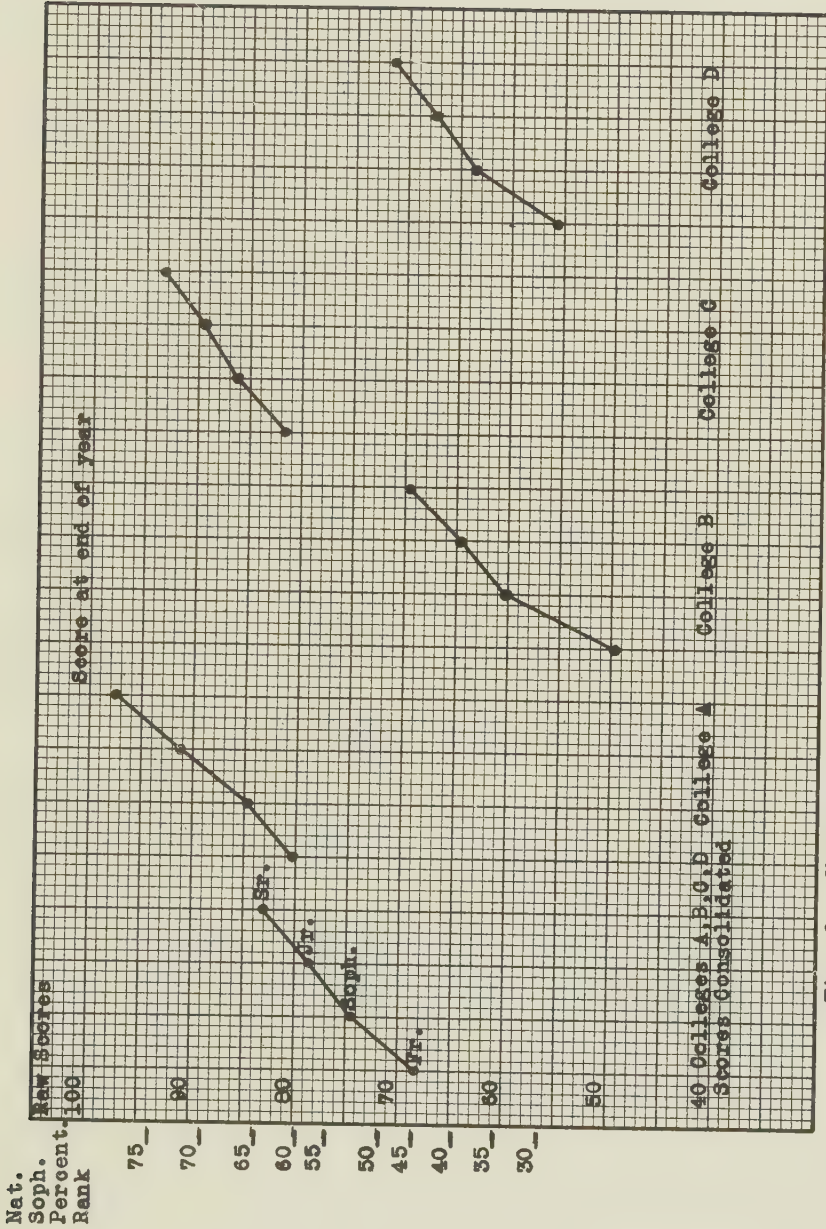


Fig. 6.--Changes in History and Social Science raw score means

reported for this section is 6.31.¹ Changes in score of 15 points or more have been regarded as significant in calculating the percentage of students gaining. The product moment correlation coefficient for the relationship between Freshman and Senior scores is .81±.01 for 355 students. The reported reliability for this section of the test is .965. The maximum possible score is 295. The range of scores is reported in Table 14.

TABLE 13

MEAN CHANGES IN RAW SCORES ON FOREIGN LITERATURE SECTION
OF CO-OPERATIVE GENERAL CULTURE TEST FOR 355
STUDENTS IN COLLEGES A, B, C, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,C,D	355	Fresh	45.3	31.2			
A,B,C,D	355	Soph.	55.0	16.7	9.7±0.72	36	
A,B,C,D	355	Jr.	56.1	17.5	1.1±0.38	19	
A,B,C,D	355	Sr.	62.1	15.2	6.0±0.37	27	50
A	61	Fresh	39.4	10.2			
A	61	Soph.	47.1	10.4	7.7±0.54	24	
A	61	Jr.	53.6	15.2	6.5±0.79	24	
A	61	Sr.	61.0	16.0	7.4±0.83	29	63
B	120	Fresh	28.0	9.3			
B	120	Soph.	38.3	12.2	10.3±0.44	33	
B	120	Jr.	42.5	15.0	4.2±0.54	20	
B	120	Sr.	49.8	12.1	7.3±0.54	27	63
C	136	Fresh	65.8	17.5			
C	136	Soph.	75.1	20.5	9.3±0.69	41	
C	136	Jr.	72.3	20.0	2.8±0.72	19	
C	136	Sr.	76.2	16.4	3.9±0.68	25	33
D	38	Fresh	36.3	18.3			
D	38	Soph.	47.1	16.5	10.8±1.18	28	
D	38	Jr.	43.2	14.0	3.9±1.05	7	
D	38	Sr.	50.2	17.6	7.0±1.11	26	52

¹Ibid., p. 10.

TABLE 14

THE RANGE OF EQUATED RAW SCORES MADE BY 355
STUDENTS ON FOREIGN LITERATURE SECTION OF
THE CO-OPERATIVE GENERAL CULTURE TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	3	113	110	4	134	130
B	2	123	121	19	198	179
C	10	172	162	19	189	170
D	11	72	61	18	90	72

The most striking fact presented in Figure 7 is the very high initial score in the Foreign Literature Test of the students in College C. The students in College B again have a low initial score. They make a steady and substantial gain through the college years, but they never come near the initial Freshman score of College C. However, reference to Table 14 discloses the fact that a student in College B makes the highest individual Senior score of all the students in all four colleges. Such individual variation within a general institutional pattern of performance is true of the scores on all the tests reported.

Table 15 reports the changes in raw scores on the fine arts section of the test. The reported standard error of measurement for this section is 6.79. Changes in scores of at least two and one-half times that, or 17 points, have been considered as significant in calculating the percentage of students gaining. The product moment correlation coefficient for the relationship between Freshman and Senior scores is $.76 \pm .01$ for 355 students. The reported reliability of this section of the test is .961.

The maximum possible score is 229. The range is given in Table 16.

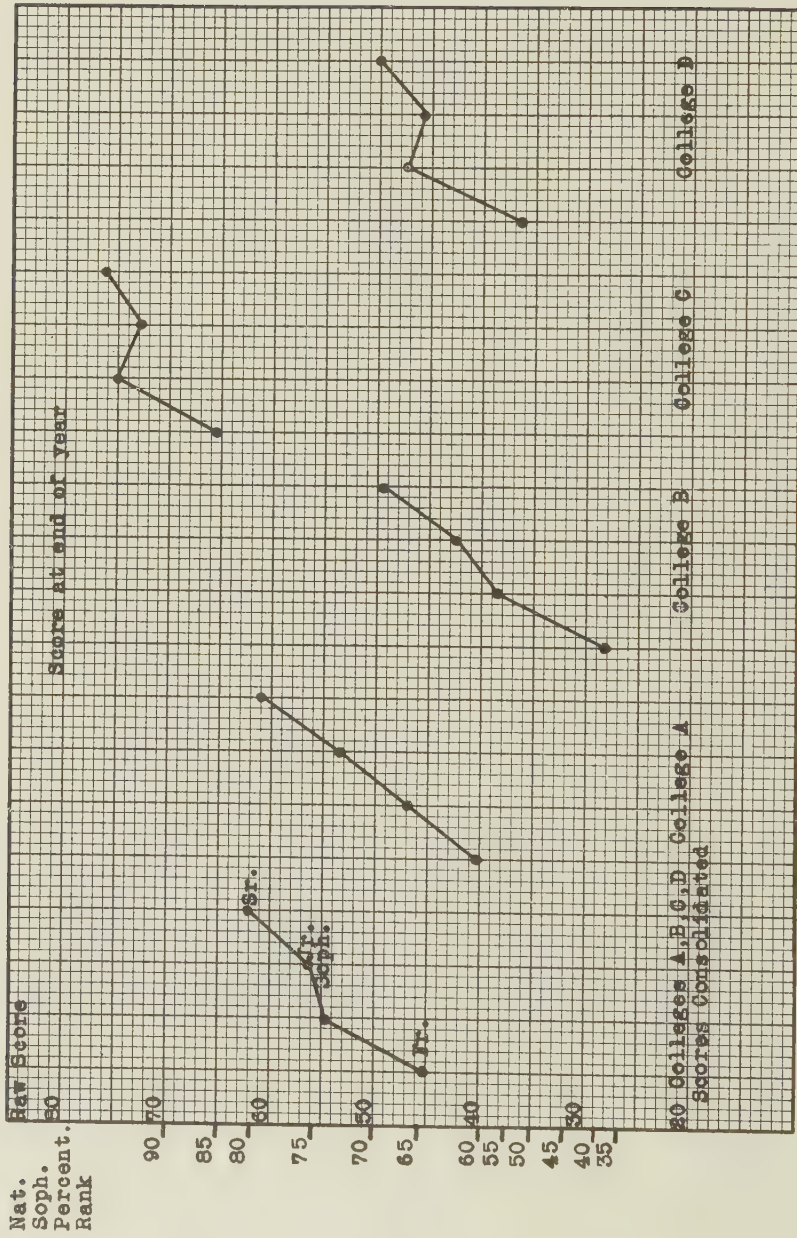


Fig. 7.--Changes in Foreign Literature raw score means

TABLE 15

MEAN CHANGES IN RAW SCORES ON FINE ARTS SECTION OF
CO-OPERATIVE GENERAL CULTURE TEST FOR 355
STUDENTS IN COLLEGES A, B, C, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,B,C,D	355	Fresh.	34.8	22.6			
A,B,C,D	355	Soph.	42.2	13.8	7.4±0.52	20	
A,B,C,D	355	Jr.	48.4	13.5	6.1±0.34	18	
A,B,C,D	355	Sr.	56.3	15.8	7.9±0.37	25	34
A	61	Fresh.	33.5	8.7			
A	61	Soph.	36.6	8.4	3.1±0.51	8	
A	61	Jr.	41.6	10.1	5.0±0.57	13	
A	61	Sr.	47.7	9.6	6.1±0.59	14	14
B	120	Fresh.	28.4	7.5			
B	120	Soph.	33.3	10.4	6.9±0.42	15	
B	120	Jr.	43.4	11.0	10.1±0.45	23	
B	120	Sr.	49.4	13.4	6.0±0.53	18	18
C	136	Fresh.	44.0	26.2			
C	136	Soph.	54.5	14.7	10.5±1.03	31	
C	136	Jr.	56.5	13.6	2.0±0.57	12	
C	136	Sr.	69.3	18.9	12.8±0.71	38	38
D	38	Fresh.	32.4	17.6			
D	38	Soph.	36.5	20.0	4.1±1.43	21	
D	38	Jr.	48.0	17.7	11.5±1.45	28	
D	38	Sr.	50.6	14.7	2.6±1.26	13	44

TABLE 16

THE RANGE OF EQUATED RAW SCORES MADE BY 355 STUDENTS
ON FINE ARTS SECTION OF THE CO-OPERATIVE GENERAL
CULTURE TEST

Col- lege	Lowest Score in Freshman Year	Highest Score in Freshman Year	Range of Scores in Freshman Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	0	75	75	5	101	96
B	3	101	98	17	121	104
C	0	121	121	20	157	137
D	2	84	82	21	114	93

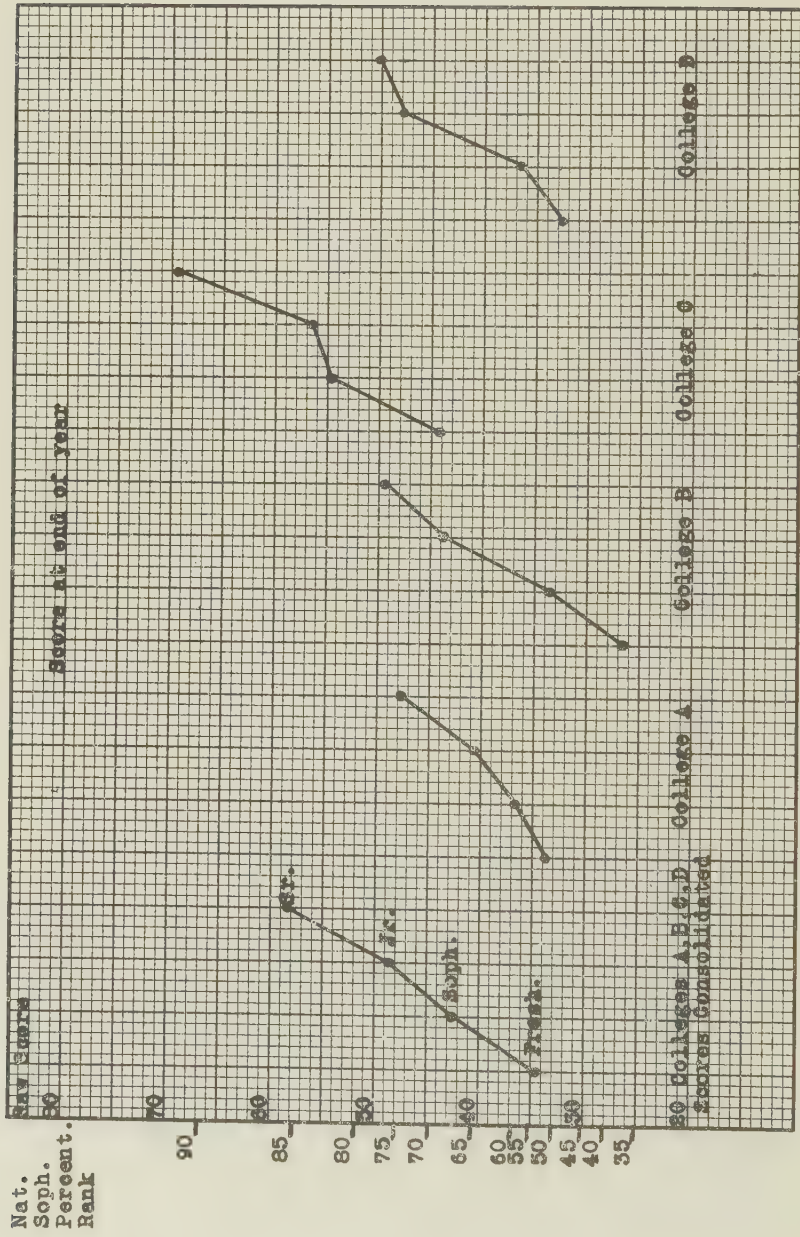


Fig. 8.--Changes in Fine Arts raw score means

Figure 8 shows College B again has the lowest initial score but its students make almost as large a gain as students in College C. On this test, the Senior mean score for students of College B is only slightly higher than the Freshman score in College C. In Table 15 it is shown that only 14 per cent of students in College A and only 18 per cent in College B make a statistically significant gain in a three-year period. In Table 16 the range of scores in the Senior year is seen to be greater for each college than the range of scores in the Freshman year. On this test all of the college mean Sophomore scores are above the national Sophomore median. College B is just above it while College C places at the 82d percentile.

Contemporary Affairs

The Co-operative Contemporary Affairs Test for College Students (Form 1937) is in two sections requiring fifty minutes each. Part I, called Public Affairs, consists of 150 multiple choice items covering: Identification of Personalities, national and international; Events, national and international; Meaning of Words in the News; Science; Reasons for Events, national and international. Part II, called Aesthetics, consists of 150 multiple-choice items covering: Books, Plays, Music and Radio, Movies, Art. It is offered by its authors as a possible index of the functioning interest of the student in certain areas of experience that lie outside the usual college courses.

Because some of the later forms of this test are not comparable section by section with the earlier forms and because the co-operating colleges did not use this test as generally as they did the other tests, it is possible to report changes in score for only 111 identical students and only for the Junior and Senior years.

Table 17 reports the changes in raw score for the test section on public affairs. The standard error of measurement is 4.65, so that changes in score of 12 points or more are considered significant in calculating the percentage of students gaining. The correlation coefficient for Sophomore and Senior scores is $.70 \pm .03$ for 111 students. The reported reliability for the entire test is .971. The maximum possible score is 224. The range of scores is shown in Table 18.

TABLE 17

MEAN CHANGES IN RAW SCORES ON PUBLIC AFFAIRS SECTION
OF CO-OPERATIVE CONTEMPORARY AFFAIRS TEST FOR
111 STUDENTS IN COLLEGES A, C, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change in Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A, C, D	111	Soph.	60.2	26.9			
A, C, D	111	Jr.	63.9	17.0	3.7±1.2	28	
A, C, D	111	Sr.	68.9	18.0	5.0±0.8	37	37
A	22	Soph.	74.5	36.6			
A	22	Jr.	87.7	22.0	13.2±3.7	54	
A	22	Sr.	86.4	22.5	- 1.3±2.4	27	40
C	72	Soph.	57.8	22.9			
C	72	Jr.	60.5	14.0	2.7±1.2	26	
C	72	Sr.	64.9	16.0	4.4±0.9	37	36
D	17	Soph.	50.9	19.7			
D	17	Jr.	46.9	13.0	- 4.0±2.3	5	
D	17	Sr.	61.1	17.5	14.2±2.0	52	41

TABLE 18

THE RANGE OF EQUATED RAW SCORES MADE BY 111 STUDENTS
ON PUBLIC AFFAIRS SECTION OF CO-OPERATIVE
CONTEMPORARY AFFAIRS TEST

Col- ege	Lowest Score in Sophomore Year	Highest Score in Sophomore Year	Range of Scores in Sophomore Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	15	147	132	24	187	163
C	9	111	102	23	169	146
D	17	90	73	22	87	65

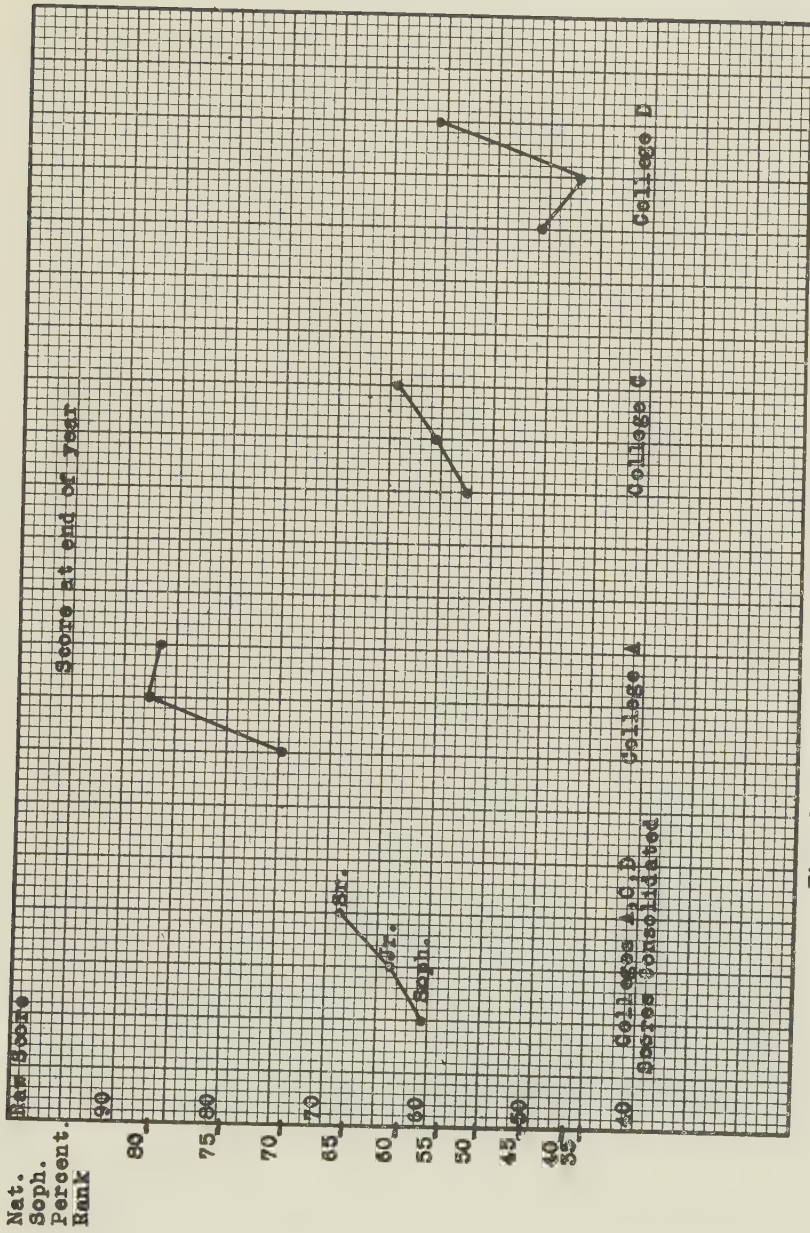


Fig. 9.--Changes in Public Affairs raw score means

Figure 9 sets forth graphically the very high initial score of College A and the low initial score of College D. Both groups gain about the same amount in score from May of the Sophomore year to May of the Senior year, but the mean Senior score in College D never approaches that of College A.

Table 19 gives the changes in score for the section on aesthetics of this test. The standard error of measurement is 3.89. Therefore, changes in score of 10 points or more have been counted as significant in calculating the percentage of students gaining. The product moment correlation coefficient for the relationship between Sophomore and Senior scores is $.78 \pm .02$. The maximum possible score is 220. The range of scores is given in Table 20.

TABLE 19

MEAN CHANGES IN RAW SCORES ON AESTHETICS SECTION OF
CO-OPERATIVE TEST IN CONTEMPORARY AFFAIRS FOR
111 STUDENTS IN COLLEGES A, C, AND D

College	N	Year Tested	Mean Score	Stand. Dev.	Mean Change of Score	Percentage of Students Gaining in 1 Year	Percentage of Students Gaining in 3 Year Period
A,C,D	111	Soph.	62.0	22.5			
A,C,D	111	Jr.	60.9	16.0	- 1.1 $\pm$ 0.9	23	
A,C,D	111	Sr.	71.2	17.0	10.3 $\pm$ 0.8	52	45
A	22	Soph.	48.1	21.6			
A	22	Jr.	55.8	10.5	7.7 $\pm$ 2.1	40	
A	22	Sr.	64.2	14.0	8.4 $\pm$ 1.2	50	54
C	72	Soph.	66.2	23.0			
C	72	Jr.	63.6	16.6	- 2.6 $\pm$ 2.4	21	
C	72	Sr.	75.3	18.0	11.7 $\pm$ 1.9	55	43
D	17	Soph.	62.1	13.5			
D	17	Jr.	55.0	15.0	- 7.1 $\pm$ 1.5	12	
D	17	Sr.	62.0	13.5	7.0 $\pm$ 1.5	41	41

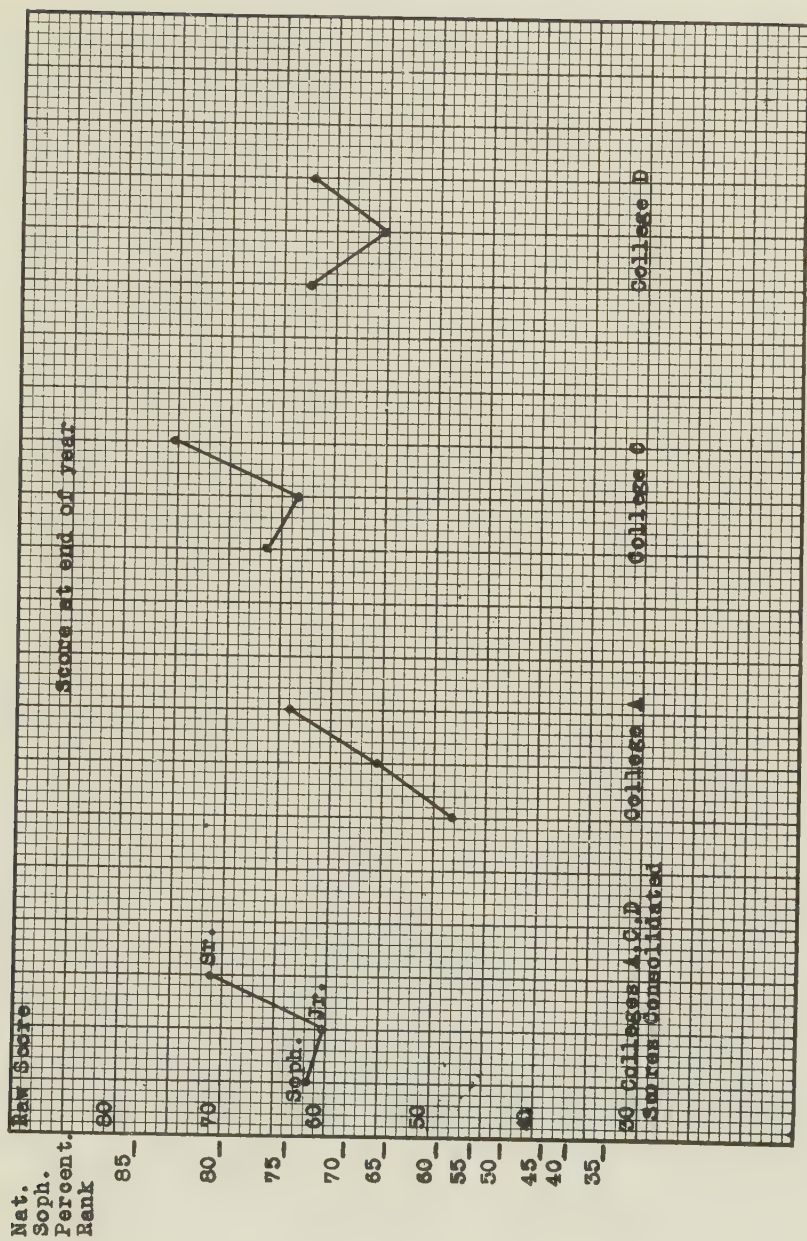


Fig. 10.--Changes in Aesthetics raw score means

TABLE 20

THE RANGE OF EQUATED RAW SCORES MADE BY 111 STUDENTS
ON AESTHETICS SECTION OF CO-OPERATIVE
CONTEMPORARY AFFAIRS TEST

Col- lege	Lowest Score in Sophomore Year	Highest Score in Sophomore Year	Range of Scores in Sophomore Year	Lowest Score in Senior Year	Highest Score in Senior Year	Range of Scores in Senior Year
A	14	99	85	3	151	148
C	30	138	108	30	141	111
D	40	99	59	32	90	58

Figure 10 shows that on this section of the test, in contrast to the performance set forth in Figure 9, College A makes a lower initial score than either C or D, but makes such a consistent gain that it exceeds the Senior score of College D. It will be noted that the Sophomore score of even College A is above the national Sophomore median as reported by the Co-operative Test Service.

General Summary

In Table 21 a summary is given of the changes in average test scores reported in this chapter. This table is read as follows: 196 students on the total English test made an initial scaled score in May of the Freshman year of 58.4 and a score of 64.5 in May of the Senior year, a gain of 6.1. The Freshman score of these students ranked at the 53d national percentile, the Sophomore score at the 59th national percentile, and the Senior score at the 62d national percentile. The national norms have been taken from A Booklet of Norms published by the Co-operative Test Service. Seventy-nine per cent of the students tested made a statistically significant gain in the three-year period.

The percentile ranks are all above 50 except in the Freshman and Sophomore scores for the test in literary acquaintance. The students tested in these colleges, then, are above the national norms in test scores in the Freshman, Sophomore, or Senior years. (Norms are not available for all tests in all years.)

TABLE 21

SUMMARY OF CHANGES IN AVERAGE CO-OPERATIVE TEST SCORES FOR
VARYING GROUPS OF STUDENTS IN FOUR COLLEGES

N	Name of Test	Kind of Score	Initial Mean Score on Freshman Test	Mean Score on Senior Test	Gain in Three Year Period	National Freshman Percentile Rank	National Sophomore Percentile Rank	National Senior Percentile Rank	Per Cent of Students Gaining in 3 Yr. Period
196	Total English	Sc. Sc.	58.4	64.5	6.1	53	59	62	79
181	English Usage	Sc. Sc.	57.8	62.4	4.6	53	62	61	46
181	Spelling	Sc. Sc.	57.5	63.2	5.7	60	67	68	58
181	Vocabulary	Sc. Sc.	59.5	66.7	7.2	52	55	61	65
157	Literary								
	Acquaintance	Sc. Sc.	54.7	62.9	8.2	36	49	51	64
355	History and Social Science								
	Foreign Literature	Raw Sc. ^a	67.9	83.0	15.1	..	53	..	39
355	Fine Arts	Raw So. ^a	45.3	62.1	16.8	..	78	..	50
111	Public Affairs	Raw Sc. ^a	34.8	56.3	21.5	..	66	..	34
	Fairs	Raw So. ^a	60.2 ^b	68.9	8.7 ^c	..	56	..	37
111	Aesthetics	Raw Sc. ^a	62.0 ^b	71.2	9.2 ^c	..	72	..	45

^aEquated to 1936 form.

^bInitial score in May of Sophomore year.

^cGain in two years.

It has been pointed out in the preceding pages that where comparable figures are available, it is evident that these students make greater gains from Freshman to Senior years than the large group of students upon whose performance the national norms are based. These national norms, however, are the result of cross-section testing rather than repeated testing of identical students, and so are not strictly comparable.

Within each of the four colleges co-operating in this study, the group of students tends to gain year by year in each subject. There is usually the greatest gain in the Sophomore year and the smallest gain in the Junior year. On the Aesthetics section of the Contemporary Affairs test, the Junior year groups show a loss in Colleges A, C, and D. College D shows a loss in the Senior year in English usage, spelling, literary acquaintance, foreign literature, and in the Junior year in public affairs. It has been pointed out that high initial scores and large gains in other years, together with the fact that the number of College D students is small, may account in part for these losses. It may be, too, that College D emphasizes types of learning even in these subjects that are not measured by tests such as these. There is further discussion of this point in Chapter V.

Within the general pattern of an upward trend of scores from Freshman to Senior year for groups of students, there is great individual variation. Large individual differences both in initial score and in amount gained or lost are found in all four colleges.

Excessive gains or losses in one year tend to be followed by a compensating score the next year, so that the percentage of students gaining in the period from the Freshman to Senior year is usually larger than the percentage gaining in any single year. This fact has seldom been pointed out in the reporting of co-operative test scores. It emphasizes the necessity of repeated testing if a true picture of student performance is to be secured.

The degree to which students hold their place in the group is indicated by correlation coefficients between Freshman and Senior scores ranging from $.81 \pm .01$ for foreign literature to $.71 \pm .02$ for literary acquaintance.

CHAPTER IV

THE RELATIONSHIP OF SCHOLASTIC APTITUDE TO ACHIEVEMENT AS MEASURED BY OBJECTIVE TESTS

The usefulness of a scholastic aptitude test as a predictive device for success in college has been investigated many times. Segel has prepared an excellent summary of the results.¹ Correlations for the Thurstone Psychological Examination scores and college grades have been reported as ranging from .27 to .62 with the median about .48.

In an earlier study² the writer reported correlations ranging from .35 to .82 for the American Council on Education Psychological Examination scores and Co-operative Test scores in General Culture, English, and Contemporary Affairs. The number of cases, however, was small.

In the present chapter, the relationship between scholastic aptitude and scores on co-operative tests is set forth in three different ways. The Pearson product moment correlation coefficients are reported first.

In Colleges A, B, and D the A.C.E. Psychological Examination, the form of the respective year, was given during Freshman week to each of the students whose scores are being studied. These scores were equated by means of tables in The Educational Record to the scores of the 1936 form of the test and these equated raw scores and raw scores on the co-operative tests equated to scores on the 1936 forms of the tests by means of tables published by the Co-operative Test Service were used in calculating the correlation coefficients. College C administered the Minnesota College Aptitude Test, forms AMCN, DOCN, or DOEP,

¹David Segel, Prediction of Success in College. United States Office of Education, Bulletin No. 15. Washington: Government Printing Office, 1934. Pp. vii + 98.

²Theodore P. Stephens, "Some Results of a Continued Testing Program in a Liberal Arts College," pp. 32, 33. Unpublished Master's thesis, University of Chicago, 1937.

in Freshman week, and these raw scores which the Testing Bureau of the University of Minnesota states are directly comparable were used in calculating the correlation coefficients for students of College C separately.

Table 22 gives the mean raw score on the aptitude test and the percentile rank for the group of students in each of the four colleges for whom four years of co-operative test scores are available. These are the students whose achievement is reported in Chapter III. The scholastic aptitude percentile ranks are based on a national norm for the A.C.E. test and on a norm for 1,198 University of Minnesota Freshmen for the Minnesota College Aptitude Test.

TABLE 22
MEAN SCORES AND PERCENTILE RANKS IN APTITUDE TESTS
FOR GROUPS OF STUDENTS IN FOUR COLLEGES

College	Name of Test Given	Number of Cases	Mean Raw Score	Percentile Rank
A	A.C.E. Psych. Exam.	65	195.0	61
B	A.C.E. Psych. Exam.	123	178.6	50
C	Minnesota	141	328.6	56
D	A.C.E. Psych. Exam.	40	209.8	69

Table 23 gives the correlation coefficients for the relationship between certain co-operative test scores made in May of the Freshman year and the scores on the A.C.E. Psychological Examination taken during Freshman week for students in Colleges A, B, and D, and the correlation coefficients for the relationship between co-operative test scores and the scores on the Minnesota College Aptitude Test taken during Freshman week by students in College C. For the sections of the Contemporary Affairs test listed in the table as Public Affairs and Aesthetics, scores made in May of the Sophomore year are used because Freshman scores were not available.

It is seen in Table 23 that there is higher correlation between the scores on the Minnesota Aptitude Test and the General Culture Test scores than there is between the scores on the A.C.E. Psychological Examination and the General Culture Test scores.

TABLE 23

PRODUCT MOMENT CORRELATION COEFFICIENTS FOR SCORES
ON SCHOLASTIC APTITUDE TESTS AND SCORES ON
CO-OPERATIVE TESTS FOR STUDENTS IN
COLLEGES A, B, C, AND D

College	N	Kind of Score	Name of Co-operative Test	Coefficient of Correlation with	
				A.C.E. Psychological Examination	Minnesota College Aptitude Test
A,B,D	222	Scaled	Total English	0.74±0.02	
A,B,D	195	Scaled	Literary Acquaintance	.58± .03	
A,B,D	222	Raw	History and Social Science	.57± .03	
C	137	Raw	History and Social Science		0.59±0.03
A,B,D	222	Raw	Foreign Literature	.55± .03	
C	137	Raw	Foreign Literature		.66± .03
A,B,D	222	Raw	Fine Arts	.49± .03	
C	137	Raw	Fine Arts		.62± .03
A & D	39	Raw	Public Affairs	.40± .07	
C	72	Raw	Public Affairs		.46± .06
A & D	39	Raw	Aesthetics	0.43±0.07	
C	72	Raw	Aesthetics		0.16±0.07

The range of correlation coefficients is about what would be expected from the reports of other investigations. It is not surprising that the coefficient should be highest for the relationship between English scores and scholastic aptitude and lowest between public affairs or aesthetics and scholastic aptitude.

Since the present investigation is primarily concerned with the progress of students as measured by test scores rather than status at any one time, attention is called to Table 24.

TABLE 24

CORRELATION OF AMOUNT OF CHANGE IN SCORE ON CO-OPERATIVE TESTS BETWEEN MAY OF FRESHMAN YEAR AND MAY OF SENIOR YEAR AND SCHOLASTIC APTITUDE FOR STUDENTS IN FOUR COLLEGES

College	Number of Cases	Name of Co-operative Test	Correlation Coefficient
A,B,D	196	English	-0.07±0.04
A,B,D	195	Literary Acquaintance	.09± .04
A,B,D	222	History, Social Science Section of General Culture	.03± .04
A,B,D	222	Foreign Literature Section of General Culture	.11± .04
A,B,D	222	Fine Arts Section of General Culture	.10± .05
C	137	History, Social Science Section of General Culture	- .05± .05
C	137	Foreign Literature Section of General Culture	.15± .05
C	137	Fine Arts Section of General Culture	.16± .05
A & D	39	Public Affairs	.13± .09
C	72	Public Affairs	- .03± .08
A & D	39	Aesthetics	.23± .09
C	72	Aesthetics	0.17±0.07

Here the relation of scholastic aptitude to the amount of gain in score from May of the Freshman year to May of the Senior year in certain co-operative tests is given. While the coefficients were calculated separately for College C (using the Minnesota Aptitude Test) and Colleges A, B, and D (using the A.C.E. Psycho-

logical Examination), to facilitate comparison they are reported in a single table. In marked contrast with the correlation coefficients reported in Table 23, no one of these coefficients in Table 24 is significant.

The data presented in Table 23 and Table 24 indicate that for these students whose scores are reported, scholastic aptitude and initial scores on the co-operative tests are definitely correlated but that there is little, if any, positive relationship between scholastic aptitude and the amount of change in co-operative test scores.

In an attempt to show this relationship between scholastic aptitude and achievement graphically and to emphasize the fact that the amount of gain in that score is not influenced by aptitude, the students for whom four annual tests were available were divided into groups as determined by the quartile scores on the scholastic aptitude test given them during Freshman week. National quartiles were used. These groups will be designated in the pages that follow as Quarter I (Q I, including students with national rank in psychological test of 25 or lower), Quarter II (Q II, including students with ranks from 50 to 26 inclusive), Quarter III (Q III, including students with ranks from 75 to 51 inclusive), and Quarter IV (Q IV, including students with ranks from 100 to 76 inclusive).

The mean initial score and the mean change in score for each quartile group were then calculated for each of the tests reported in the previous chapter. The results are set forth in the tables and figures which follow.

Table 25 should be read as follows: when English scores for 196 students in Colleges A, B, and D are consolidated and grouped by quarters on the basis of psychological scores, 48 students in the highest quarter (Q IV) make a mean initial score of 66.2 in May of the Freshman year, they gain 2.7 scaled score units in the Sophomore year, 1.2 units in the Junior year, and 1.5 units in the Senior year; or a total of 5.4 units in the three years. After giving the changes in score in Table 25 for the groups when the scores of three colleges are consolidated, the scores are given for each college separately.

Figure 11 gives the same material graphically, and should be read from left to right as follows: when scores for colleges

TABLE 25

MEAN CHANGES IN TOTAL ENGLISH SCALED SCORES WHEN 196 STUDENTS
ARE GROUPED BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A, B, D Consoli- dated	IV-High	48	66.2	2.7	1.2	1.5	5.4
	III	56	60.4	2.7	2.3	0.9	5.9
	II	51	55.4	4.2	0.3	2.0	6.5
	I-Low	41	51.3	3.8	- 0.2	2.7	6.3
A	IV	17	65.8	1.2	1.5	2.9	5.6
	III	16	58.9	1.7	2.2	2.0	5.9
	II	16	54.5	3.7	1.6	1.4	6.7
	I	10	50.4	2.4	0.3	2.1	4.8
B	IV	22	66.4	2.9	1.4	2.0	6.3
	III	36	61.2	2.9	2.1	0.9	5.9
	II	34	55.7	4.6	- 0.7	2.7	6.6
	I	27	51.0	4.3	- 0.7	3.2	6.8
D	IV	9	66.8	5.5	0.7	- 2.6	3.6
	III	4	59.7	6.0	6.0	- 4.2	7.8
	II	1	59.0	-3.0	13.0	-12.0	-2.0
	I	4	55.7	4.0	1.7	1.0	6.7

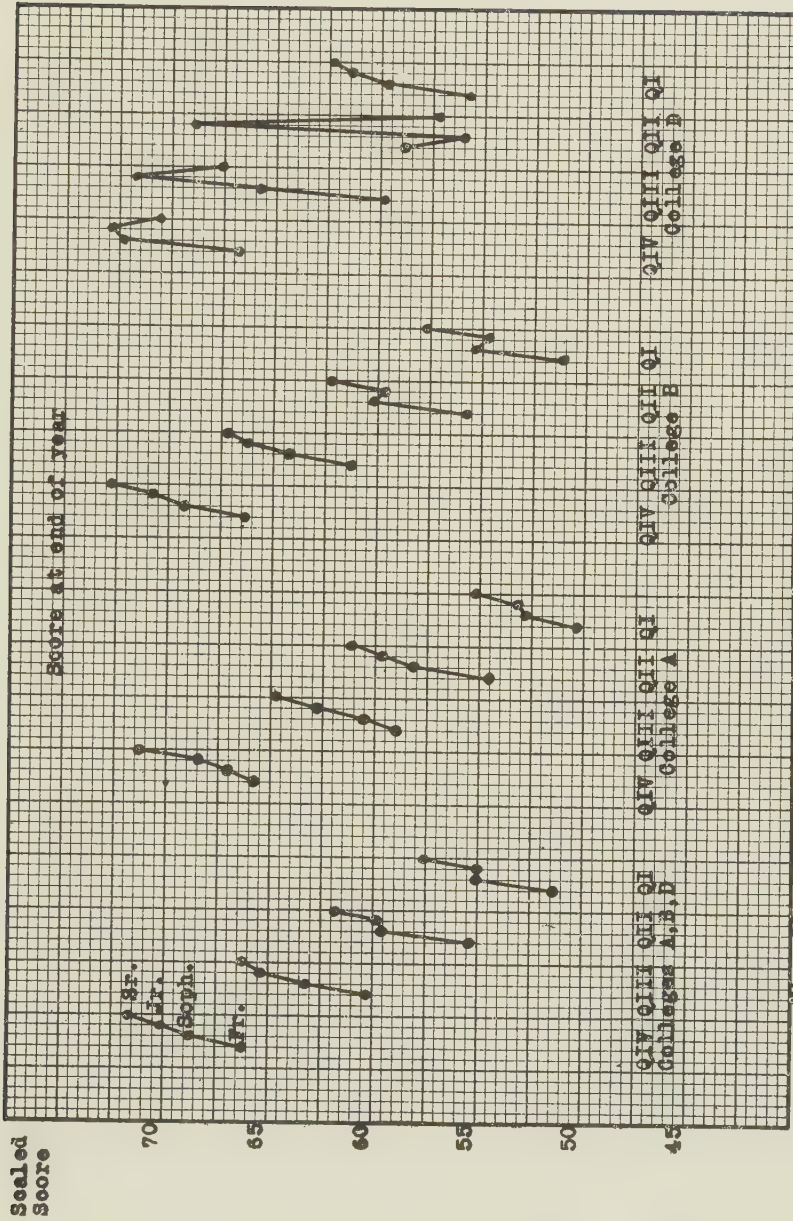


Fig. 11.--Changes in total English scaled score means when students are grouped by psychological test scores.

A, B, and D are consolidated, students in Q IV make a scaled score in May of the Freshman year of 66.2, a score of 68.9 in the Sophomore year, 70.1 in the Junior year, and 71.6 in the Senior year. The vertical distance between the points as indicated by the scale at the left margin of the figure represents the gain in respective years.

Attention is called to the clear relationship between scholastic aptitude and initial scores on the English test as expressed by the approximately equal difference between the initial scores in each quartile group. Equally clear is the approximately equal gain that is shown by each quartile group. A third fact that is noticeable is the tendency, except in Quarter III, to make a very small gain or to suffer an actual loss in the Junior year. This fact will be noticed for other tests to be reported as well.

When the graphs for the performance of individual colleges are studied, consideration must be given to the fact that the number of cases for College D is very small. This no doubt accounts in part for the erratic behavior of the scores. In most cases the change in score for College D alone is not statistically significant.

In each one of the colleges the mean Senior score of the lowest quarter and of even Q II is far below the Freshman score of Q IV.

The same general situation is found for the scores for the sections of this test as given in Tables 26, 27, 28, and Figures 12, 13, and 14.

In the scores reported in Table 29 and Figure 15 for the Literary Acquaintance Test, more of a tendency for the scores of contiguous quarter groups to overlap partially is seen. However, the lowest quarter is still far below the highest group. More difference between the amount of gain made by students in the different colleges is also apparent.

In Tables 30, 31, 32 and in Figures 16, 17, 18 the records of changes in score are given for the three sections of the General Culture Test reported in this study: History and Social Science, Foreign Literature, and Fine Arts. In these figures, the same general tendency for each quarter to gain approximately the same amount in score is found when the scores of all colleges

TABLE 26
MEAN CHANGES IN ENGLISH USAGE SCALED SCORES WHEN 182 STUDENTS
ARE GROUPED BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A,B,D Consoli- dated	IV-High	43	64.9	2.5	0.8	3.0	6.3
	III	54	60.2	2.1	1.9	0	4.0
	II	48	54.3	3.9	0.4	0	4.3
	I-Low	37	51.5	3.8	-1.4	0.7	3.1
A	IV	12	64.4	-0.7	1.1	5.1	5.5
	III	13	58.7	3.3	0.3	1.0	4.6
	II	13	51.8	6.1	0.7	-0.8	6.0
	I	6	55.1	2.7	4.7	2.3	9.7
B	IV	22	64.8	2.5	2.1	1.8	6.4
	III	37	60.9	1.4	2.1	0.6	4.1
	II	34	55.3	2.9	0.4	2.9	6.2
	I	27	49.3	4.1	-0.2	1.1	5.0
D	IV	9	65.8	7.4	-2.9	3.0	7.5
	III	4	59.0	6.6	5.0	-9.5	2.1
	II	1	52.0	8.0	-5.0	1.0	4.0
	I	4	61.2	3.5	-5.0	-4.5	-6.0

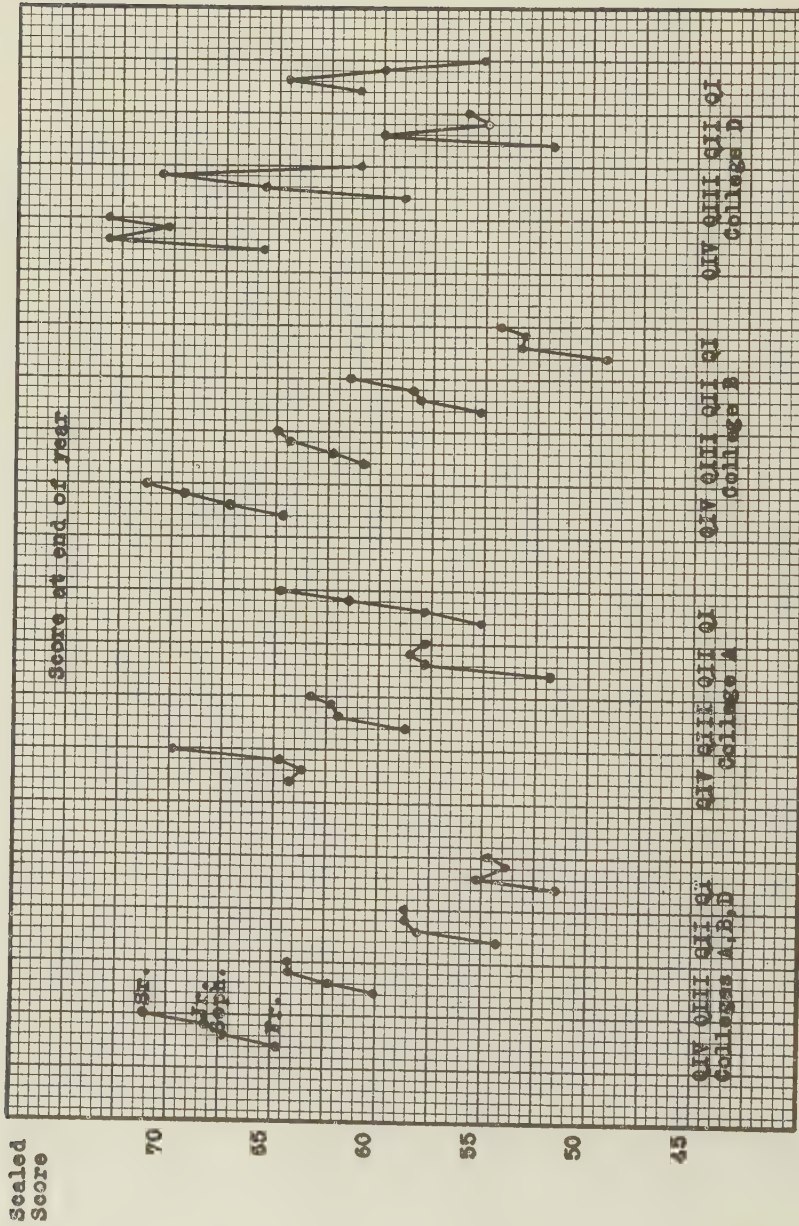


TABLE 27

MEAN CHANGES IN VOCABULARY TEST SCALED SCORES WHEN 182 STUDENTS
ARE GROUPED BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A,B,D Consoli- dated	IV-High	43	68.0	2.7	1.3	1.8	5.8
	III	54	61.4	2.0	3.0	2.2	7.2
	II	48	55.6	4.0	0.6	2.4	7.0
	I-Low	37	51.5	3.8	0.2	4.0	8.0
A	IV	12	68.7	1.7	2.8	0.5	5.0
	III	13	64.9	0.4	4.5	1.4	6.3
	II	13	56.5	3.4	2.8	1.7	7.9
	I	6	52.5	2.0	4.7	- 1.0	5.7
B	IV	22	67.8	2.4	0.8	2.9	6.1
	III	37	60.8	2.1	2.1	2.4	6.6
	II	34	55.0	4.6	- 0.6	3.0	7.0
	I	27	50.8	4.5	- 1.7	5.4	8.2
D	IV	9	66.2	5.2	0.6	1.2	7.0
	III	4	55.0	8.0	6.5	3.3	17.8
	II	1	62.0	-8.0	14.0	-11.0	- 5.0
	I	4	54.5	2.0	6.5	2.2	10.7

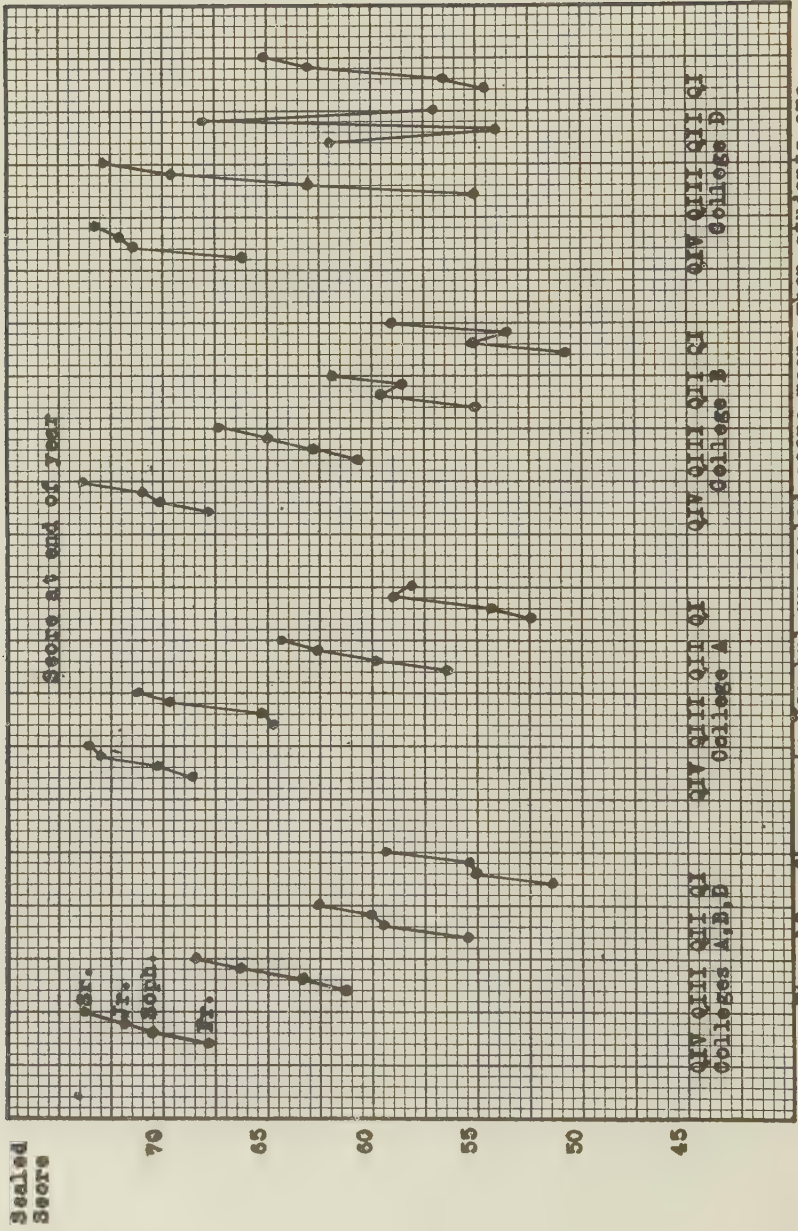


Fig. 13.--Changes in Vocabulary sealed score means when students are grouped by psychological test scores.

TABLE 28

MEAN CHANGES IN SPELLING TEST SCALED SCORES WHEN 182 STUDENTS
ARE GROUPED BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A, B, D Consoli- dated	IV-High	43	62.6	3.4	0.3	1.4	5.1
	III	54	59.6	3.5	1.7	0	5.2
	II	48	55.7	3.9	1.2	1.9	7.0
	I-Low	37	52.1	3.4	0.2	1.6	5.2
A	IV	12	60.7	3.2	- 2.1	4.2	5.3
	III	13	55.2	0.2	3.0	1.9	5.1
	II	13	54.4	2.2	2.1	4.6	8.9
	I	6	50.0	2.8	2.0	1.3	6.1
B	IV	22	63.2	3.8	0.6	0.9	5.3
	III	37	59.1	4.9	1.3	-0.6	5.6
	II	34	56.0	4.9	0.1	1.6	6.6
	I	27	51.5	4.2	- 0.3	1.5	5.4
D	IV	9	63.6	3.0	2.3	-0.9	4.4
	III	4	63.0	0.7	1.6	1.7	4.0
	II	1	56.5	-4.5	12.5	-5.5	2.5
	I	4	59.2	-1.2	1.2	2.0	2.0

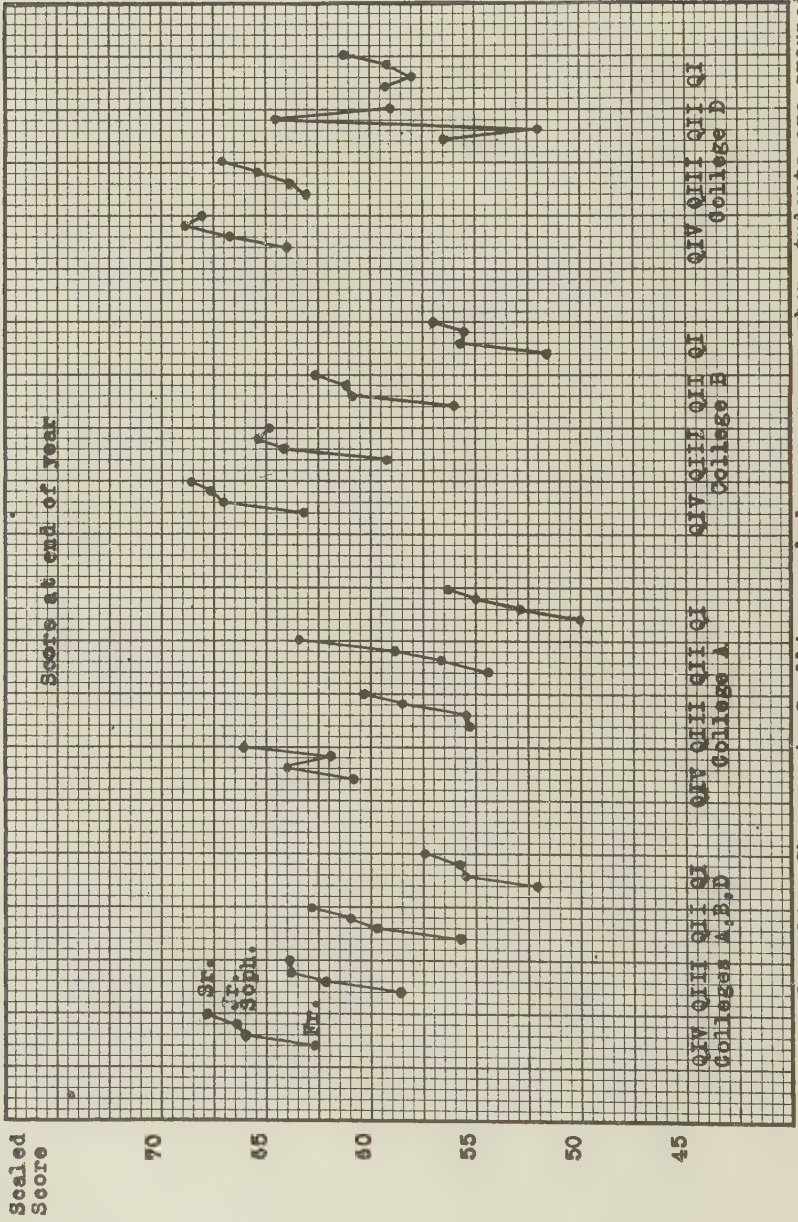


Fig. 14.--Changes in Spelling scaled score Means when students are grouped by psychological test scores.

TABLE 29

MEAN CHANGES IN LITERARY ACQUAINTANCE TEST SCALED SCORES WHEN 157 STUDENTS
ARE GROUPED BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A, B, D Consoli- dated	IV-High	58	62.4	4.4	3.1	1.0	8.5
	III	46	55.7	3.4	3.0	1.9	8.3
	II	42	51.7	4.7	0.2	2.9	7.8
	I-Low	31	47.8	6.7	- 0.3	0.4	6.8
A	IV	7	64.5	4.6	2.9	2.1	9.6
	III	7	59.3	5.4	- 0.1	7.3	12.6
	II	6	52.8	2.5	1.0	6.1	9.6
	I	1	45.0	4.0	11.0	-2.0	13.0
B	IV	23	61.3	4.6	2.1	2.1	8.8
	III	37	54.7	3.5	3.2	0.7	7.4
	II	36	51.6	5.1	0.1	2.4	7.6
	I	26	47.3	6.6	- 1.7	1.9	6.8
D	IV	8	63.5	3.5	6.0	- 3.2	6.3
	III	2	60.5	-5.0	10.0	5.5	10.5
	II	0	0	0	0	0	0
	I	4	51.7	7.7	6.5	- 8.2	6.0

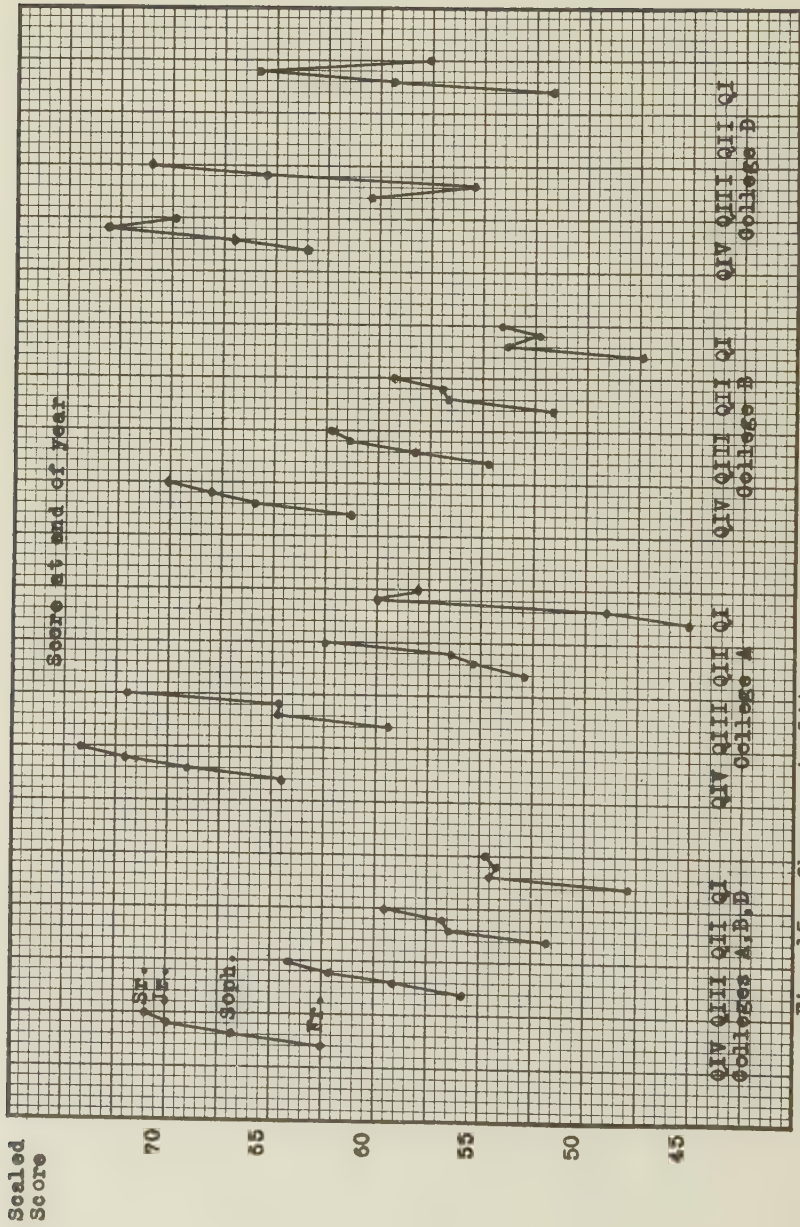


Fig. 15.--Changes in Literary Acquaintance scaled score means when students are grouped by psychological test scores.

TABLE 30

MEAN CHANGES IN EQUATED RAW SCORES ON HISTORY AND SOCIAL SCIENCE SECTION
OF GENERAL CULTURE TEST WHEN 355 STUDENTS ARE GROUPED BY
QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A, B, C, D Consoli- dated	IV-High	106	96.2	6.8	1.3	4.6	12.7
	III	95	65.7	6.9	4.1	4.9	15.9
	II	85	54.6	5.9	2.9	3.3	12.1
	I-Low	69	43.9	5.5	8.1	3.2	16.8
A	IV	18	111.9	8.3	1.3	5.7	15.6
	III	17	90.4	- 4.2	12.7	2.0	10.5
	II	16	58.7	10.0	1.4	4.8	16.2
	I	10	38.8	4.2	11.4	5.0	20.6
B	IV	22	78.5	15.2	- 2.5	11.1	23.8
	III	37	50.8	10.7	5.1	5.2	21.0
	II	33	39.9	9.1	3.9	3.4	16.4
	I	28	36.8	9.6	7.6	- 0.1	17.1
C	IV	48	108.2	5.1	0.6	4.4	10.1
	III	30	79.0	5.3	2.4	5.4	13.1
	II	33	66.1	1.5	3.1	1.5	6.1
	I	25	53.9	6.2	6.5	5.6	18.3
D	IV	18	70.1	7.5	9.1	1.4	18.0
	III	11	41.6	15.6	- 7.6	7.1	15.1
	II	3	54.3	- 4.6	- 2.3	14.0	7.1
	I	6	43.6	2.6	12.0	5.8	20.4

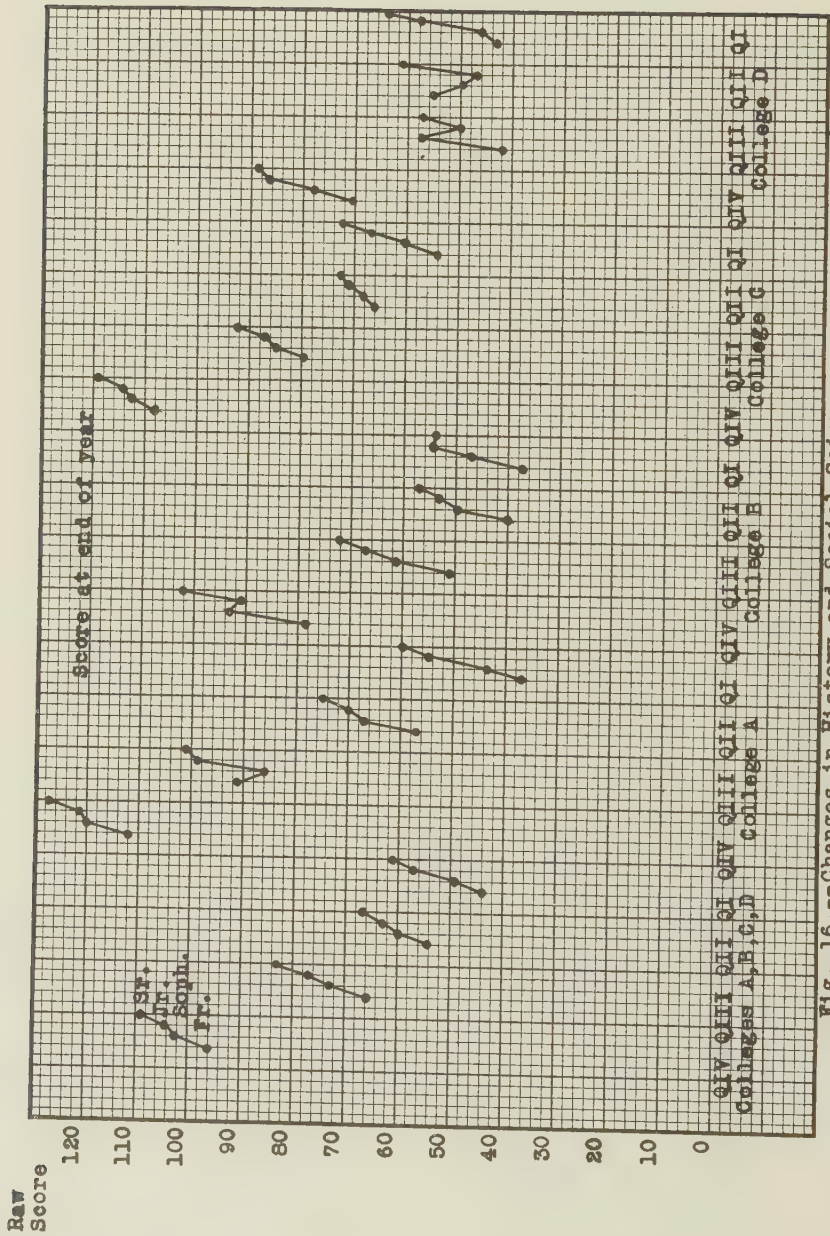


Fig. 16.--Changes in History and Social Science raw score means when students are grouped by psychological test scores.

TABLE 31

MEAN CHANGES IN EQUATED RAW SCORES ON FOREIGN LITERATURE SECTION
OF GENERAL CULTURE TEST WHEN 355 STUDENTS ARE GROUPED
BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A. B. C. D Consoli- dated	IV-High	106	69.6	12.7	0.1	5.6	18.4
	III	95	41.6	11.3	0	4.4	15.7
	II	85	34.4	7.4	3.0	7.8	18.2
	I-Low	69	26.2	6.1	3.0	4.4	13.5
A	IV	18	52.5	7.6	3.3	11.1	22.0
	III	17	41.0	11.2	5.8	9.4	26.4
	II	16	32.4	6.4	7.8	5.2	19.4
	I	10	25.5	4.9	11.7	- 0.5	16.1
B	IV	22	47.2	15.0	4.8	7.5	27.3
	III	37	29.9	11.6	3.3	4.9	19.8
	II	33	21.4	9.4	3.3	8.3	21.0
	I	28	16.2	8.5	5.5	7.1	21.1
C	IV	48	94.3	14.2	- 0.8	- 0.8	12.6
	III	30	64.1	10.0	- 8.3	5.2	6.9
	II	33	49.4	5.9	- 0.7	6.9	12.1
	I	25	36.1	4.8	- 2.5	3.4	5.7
D	IV	18	48.3	11.3	- 6.5	14.7	19.5
	III	11	20.5	14.4	2.5	- 7.4	9.5
	II	3	23.3	7.3	15.3	26.6	49.2
	I	6	33.1	3.5	0	4.0	7.5

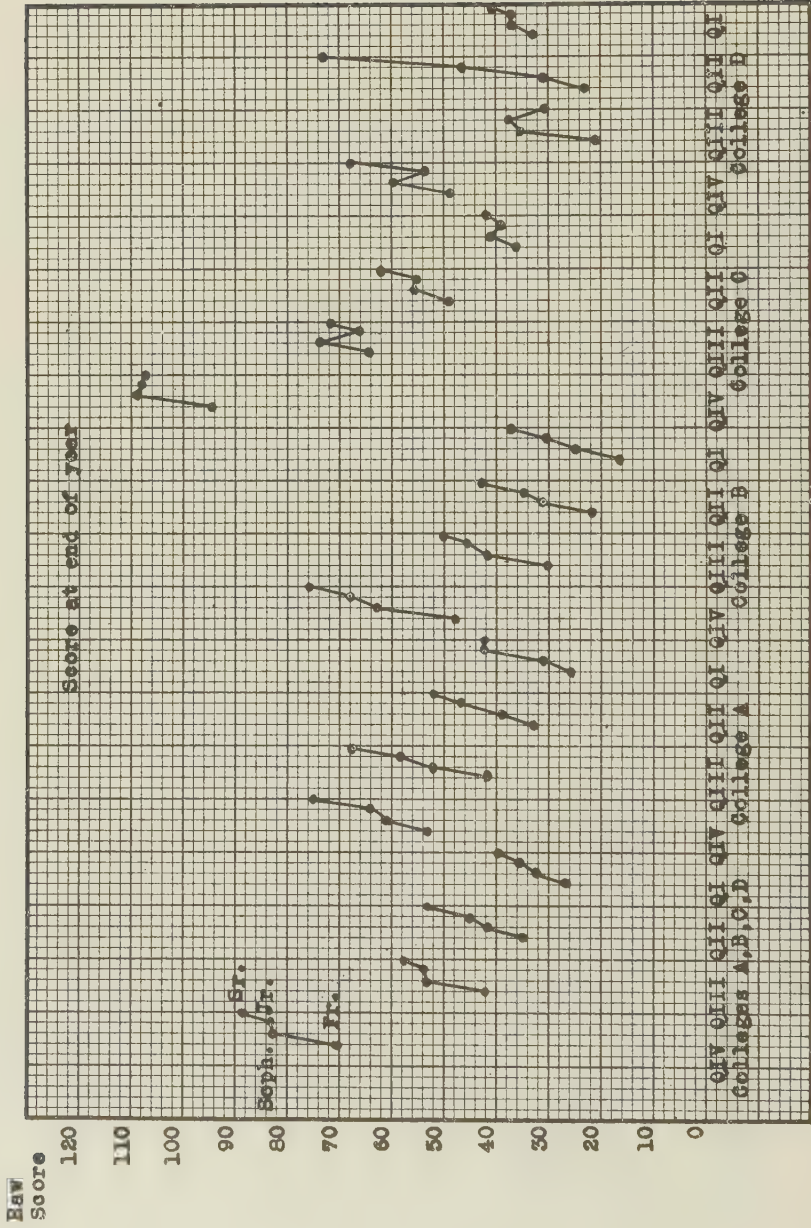


Fig. 17.--Changes in Foreign Literature raw score means when students are grouped by psychological test scores.

TABLE 32

MEAN CHANGES IN EQUATED RAW SCORES ON FINE ARTS SECTION OF GENERAL
CULTURE TEST WHEN 355 STUDENTS ARE GROUPED BY QUARTERS
ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Freshman Year	Mean Change in Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Three Years
A, B, C, D Consoli- dated	IV-High	106	51.6	9.7	6.2	10.4	26.3
	III	95	33.3	7.6	8.1	6.1	21.8
	II	85	28.5	4.8	5.9	10.4	21.1
	I-Low	69	19.1	7.1	12.7	8.1	27.9
A	IV	18	42.9	6.8	5.3	5.4	17.5
	III	17	34.5	3.5	7.1	8.2	18.8
	II	16	30.9	1.2	6.7	4.7	12.6
	I	10	17.6	1.6	0.4	6.8	8.8
B	IV	22	39.9	12.4	12.3	4.4	29.1
	III	37	30.1	7.2	10.3	4.5	22.0
	II	33	21.2	4.4	10.1	8.6	23.1
	I	28	16.9	6.0	8.2	6.2	20.4
C	IV	48	64.9	12.5	1.7	16.6	30.8
	III	30	40.1	14.7	0.5	11.2	26.4
	II	33	36.3	5.8	1.4	15.5	22.7
	I	25	20.8	6.6	6.6	8.9	22.1
D	IV	18	44.8	1.8	11.9	6.3	20.0
	III	11	23.5	- 4.3	23.0	- 5.4	13.3
	II	3	11.0	17.6	5.5	3.6	26.5
	I	6	25.6	17.6	- 1.1	4.3	20.8

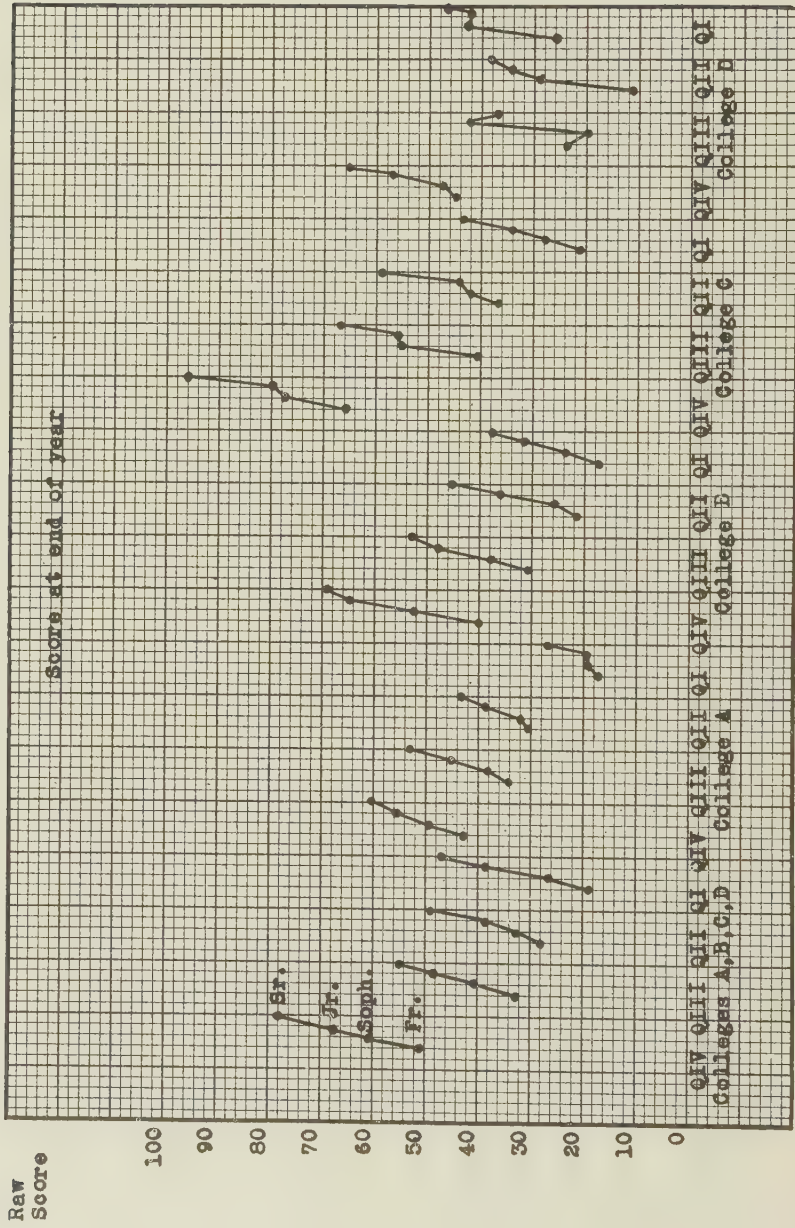


Fig. 18.--Changes in Fine Arts raw score means when students are grouped by psychological test scores.

are consolidated. When the scores are separated by colleges, the number of cases is often so small that the changes in score are not necessarily significant. Whenever the means approach a reliability of four times the probable error of the difference of the means, the same general pattern of equal gains for each quarter appears.

In History and Social Science (Fig. 16) College A shows the highest score for the top quarter and the lowest score for the bottom quarter. College C shows only half as much gain for Q II as for Q I. College D is consistently low in this test with little difference between the three lower quarters, but here again the sampling is inadequate and the means are not reliable.

In Foreign Literature (Fig. 17) College C shows a very high score for its highest quarter, yet very little gain in score for the other quarters.

The scores in Fine Arts (Fig. 18) show less difference in initial scores between quarters than did the other tests. Except for Q I in College A which gains very little, the various quarters tend to show nearly the same amount of gain.

In setting forth the facts concerning the scores on the sections of the Contemporary Affairs Test entitled Public Affairs and Aesthetics, it has not been possible to report scores for the Freshman year. This fact accounts for the difference in the appearance of the graphs. The smaller number of cases when the groups are separated by colleges contributes to the erratic nature of the curves. However, the same general tendencies are seen clearly when the scores for the three colleges are consolidated.

The scores on the two sections of the test as presented in Tables 33 and 34 and in Figures 19 and 20, show marked differences in the performance of the colleges. Because of the inadequacy of the sampling, the data are suggestive rather than conclusive. College A is high in Public Affairs and a little below average in Aesthetics. Its lowest quartile group shows actual loss in score. College C is below average in Public Affairs and a little below average in Aesthetics. Its lowest quartile group shows actual loss in score. College C is below average in Public Affairs and above in Aesthetics. College D is below average in

TABLE 33

MEAN CHANGES IN EQUATED RAW SCORES ON PUBLIC AFFAIRS SECTION OF
CONTEMPORARY AFFAIRS TEST WHEN 111 STUDENTS ARE GROUPED BY
QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Two Years
A, C, D Consoli- dated	IV-High	31	72.1	6.4	6.3	12.7
	III	20	71.9	- 1.4	4.3	2.9
	II	36	52.3	3.9	7.0	10.9
	I-Low	24	45.6	7.3	2.3	9.6
A	IV	4	93.4	39.0	- 5.2	33.8
	III	6	98.4	5.3	4.8	10.1
	II	7	65.8	14.2	1.7	15.9
	I	5	44.8	14.2	- 8.8	5.4
C	IV	20	71.8	3.8	4.3	8.1
	III	12	65.9	- 4.9	3.9	- 1.0
	II	25	48.3	3.4	7.9	11.3
	I	15	48.0	6.7	2.5	9.2
D	IV	7	60.7	- 4.4	1.8	- 2.6
	III	2	28.5	- 1.0	5.0	4.0
	II	4	53.7	- 11.2	10.7	- 0.5
	I	4	37.7	1.0	15.7	16.7

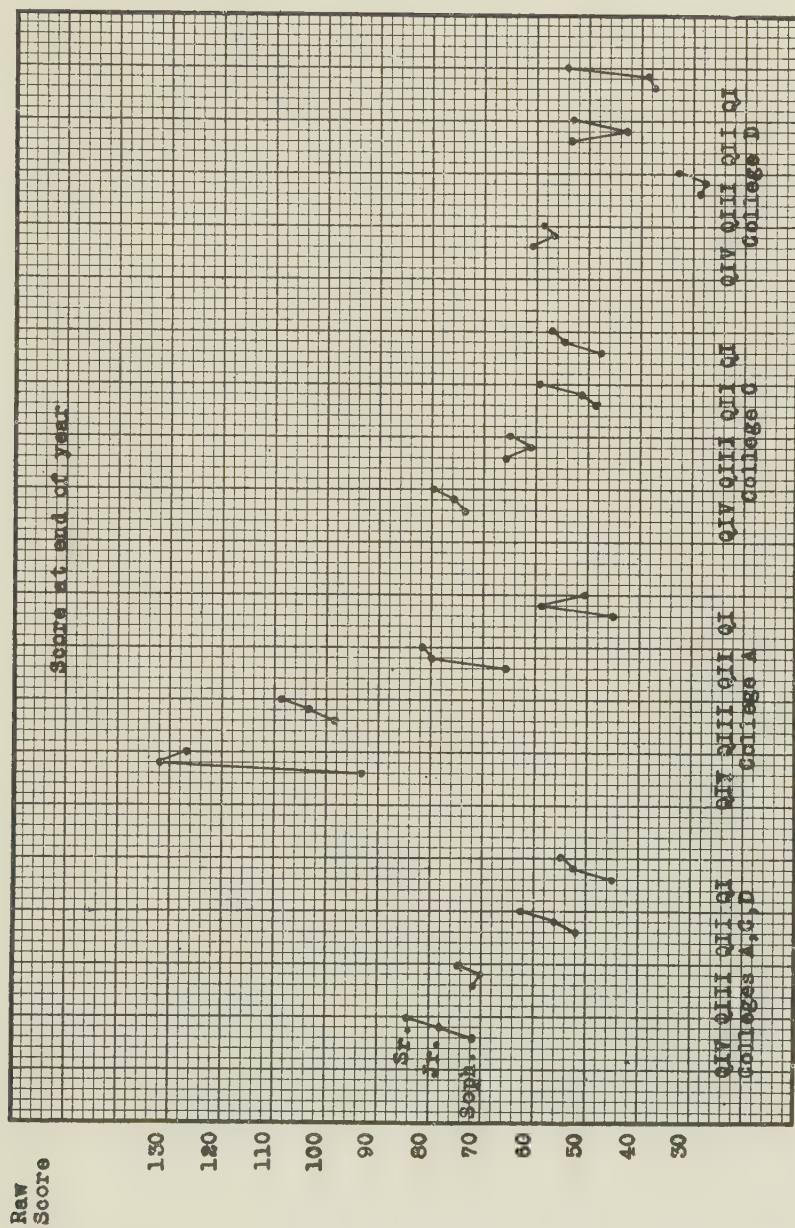


Fig. 19.--Changes in Public Affairs raw score means when students are grouped by psychological test scores.

TABLE 34
 MEAN CHANGES IN EQUATED RAW SCORES ON AESTHETICS SECTION OF
 CONTEMPORARY AFFAIRS TEST WHEN 111 STUDENTS ARE GROUPED
 BY QUARTERS ON BASIS OF PSYCHOLOGICAL TESTS

College	Classification by Psychological Score	Num- ber of Cases	Mean Initial Score in May of Sophomore Year	Mean Change in Junior Year	Mean Change in Senior Year	Mean Change in Two Years
A, C, D Consoli- dated	IV-High	31	72.3	0	14.9	14.9
	III	20	61.6	3.0	8.2	11.2
	II	36	59.4	- 3.2	10.8	7.6
	I	24	51.0	2.9	5.5	8.4
A	IV	4	50.5	13.2	15.2	28.4
	III	6	51.5	10.3	10.5	20.8
	II	7	48.6	8.6	9.6	18.2
	I	5	40.6	- 0.6	- 1.8	- 2.4
C	IV	20	77.5	- 1.6	16.1	14.5
	III	12	68.0	- 0.2	10.1	9.9
	II	25	60.8	4.3	11.1	15.4
	I	15	56.3	- 2.5	8.5	6.0
D	IV	7	69.9	- 3.0	11.3	8.3
	III	2	54.0	0.5	-10.0	- 9.5
	II	4	69.5	-16.7	11.0	- 5.7
	I	4	44.0	- 7.5	3.5	- 4.0

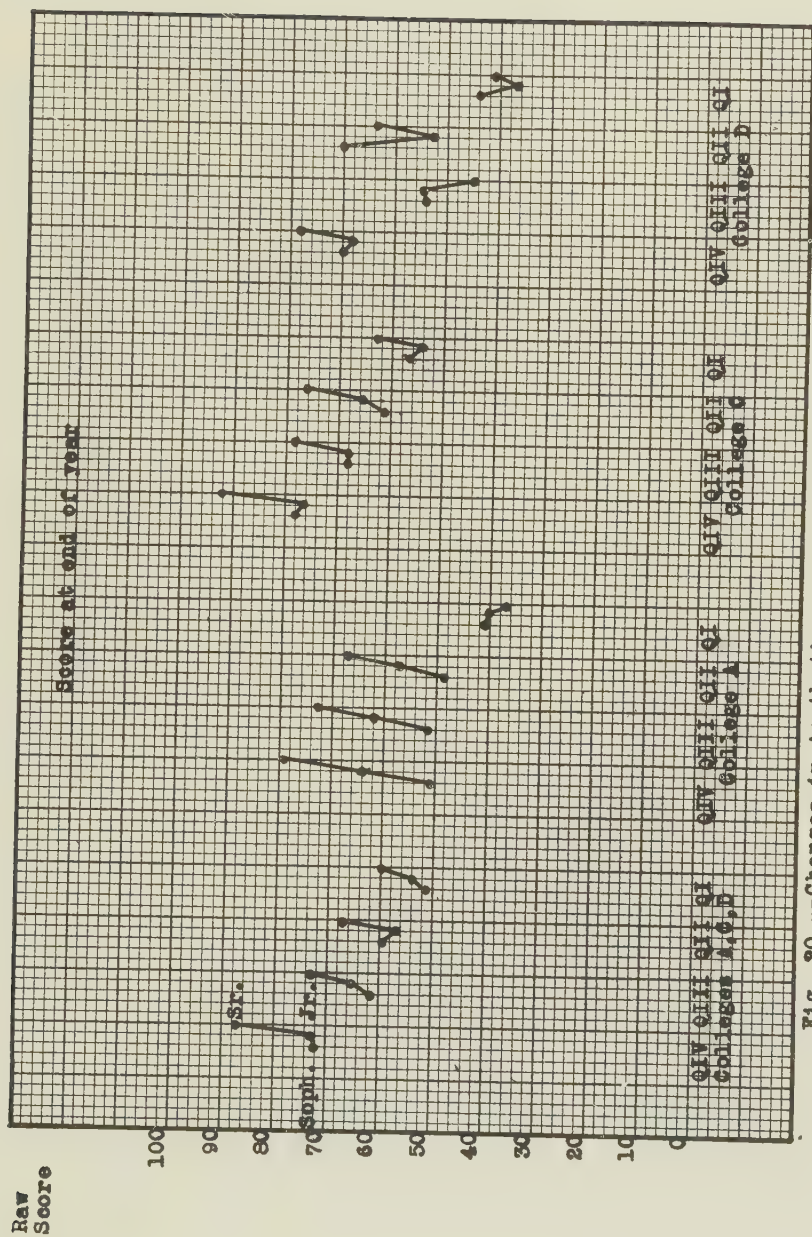


Fig. 20.--Changes in Aesthetics raw score means when students are grouped by psychological test scores.

Aesthetics and very low in Public Affairs. College A tends to show a larger amount of net gain in both sections of the test. With such differences in performance on the two sections of the one test, it would obscure the true picture to report a single score for the entire test, so only the scores for the separate sections have been used.

Summary

The relation of scholastic aptitude to achievement as measured by objective tests has been reported in this chapter.

The correlation between scholastic aptitude scores of Freshman week and certain co-operative test initial scores in May of the Freshman year ranges from $.40 \pm .07$ for public affairs to $.74 \pm .02$ for English. The correlation coefficients for changes in co-operative test score from May of the Freshman year to May of the Senior year and scholastic aptitude range from $-.07 \pm .04$ for English to $.23 \pm .09$ for aesthetics. Thus there is no substantial positive relationship between scholastic aptitude and the amount of change in score in the last three years of college.

The students whose scores were reported in the previous chapter were divided into groups by national quartile scores in the respective psychological test. For each of these groups, the mean changes in score year by year were computed for all the colleges and for each college. The results as reported in preceding charts and figures show that while there is considerable variation from college to college and from test to test, students in all quarters tend to gain about as much in score on co-operative tests in the period extending from May of the Freshman year to May of the Senior year.

The percentage of students in each quarter who gain in a three-year or a two-year period is shown in Table 35. Only gains that were at least two and one-half times the standard error of measurement as reported by the Co-operative Test Service were considered in calculating the percentage of students gaining. While again there is variation from test to test and from year to year, in general all quarters show about the same percentage of students gaining over a period of three years. A smaller percentage of students in the lowest group, however, gain in score

in the two sections of the contemporary affairs test.

TABLE 35

PERCENTAGES OF STUDENTS GAINING IN CERTAIN CO-OPERATIVE
TEST SCORES WHEN GROUPED BY QUARTERS ON BASIS OF
PSYCHOLOGICAL TESTS

Name of Test	Classification by Psychological Score	N	Percentage Gaining in Three Years
Total English	IV	48	77
	III	57	81
	II	51	84
	I	41	73
Literary Acquaintance	IV	38	71
	III	46	57
	II	42	74
	I	31	48
History, Social Science	IV	106	40
	III	95	36
	II	85	34
	I	69	44
Foreign Literature	IV	106	55
	III	95	48
	II	85	61
	I	69	40
Fine Arts	IV	106	60
	III	95	57
	II	85	53
	I	69	51
Public Affairs	IV	31	50*
	III	21	15
	II	35	36
	I	24	29
Aesthetics	IV	31	61
	III	21	43
	II	35	54
	I	24	29

*All percentages below this point in this table are for two-year gains.

The findings of this chapter for the relationship between scholastic aptitude and single or initial scores in achievement tests are in accord with reports of many similar investigations.

The finding that there is no significant positive correlation between amount of gain and scholastic aptitude is less familiar. The typical student of low aptitude in these colleges tends to gain as much in test scores during the college course as the more highly endowed student, yet he seldom approaches the superior student in absolute score. Usually the student below Q_1 does not, in his Senior year, reach the initial Freshman score of the student above Q_3 .

The distinction between status and progress in achievement in relation to scholastic aptitude has important implications for education. Individual differences in students are now taken for granted. The facts presented in this chapter show that the differences in the initial scores for these students tend to be much greater than the differences in the rate of gain. With individual exceptions, each quarter tends to gain about as much in score as the other quarters.

From the standpoint of motivation in the instructional process, this fact of approximately equal gain makes attractive the suggestion that has been made by Dr. Ben Wood¹ and others that perhaps two sets of marks should be given. One set might denote individual accomplishment in reference to the status of a student when he begins a particular course. Pre-testing would be desirable. Scholastic aptitude could be taken into consideration and suitable recognition given to superior relative achievement. The other set of marks would denote individual accomplishment in reference to a standard of achievement that would have national recognition. These marks would be used on transcripts of credits, for professional certification and for all purposes where a measure of absolute competence is imperative.

Marks of these two types would be helpful when supplemented by other types of reports, including anecdotal records, in educational counselling.

To the investigator, the facts reported in this chapter

¹Ben Wood, "The Need for Comparable Measurements in Individualizing Education," The Educational Record, XX, No. 12 (January, 1939), 23-26. The American Council on Education.

give emphasis to the need for the greatest possible individualization of education. They also raise the question whether, if comparable forms of tests had been available to measure higher mental processes than those involved in the tests used, students of varying scholastic aptitude would have shown a greater range of gain in scores. No evidence is offered at that point.

CHAPTER V

THE RELATIONSHIP BETWEEN COLLEGE COURSES TAKEN BY STUDENTS AND ACHIEVEMENT AS MEASURED BY CO-OPERATIVE TEST SCORES

The co-operative achievement tests used in this investigation were prepared by other persons than the instructors in the four co-operating colleges. Furthermore, the particular tests used in this investigation measure achievement in areas of general education that are not confined to particular courses. This might be true even in a test such as Literary Acquaintance which presumably might parallel course content to a greater degree than the aesthetics section of the Contemporary Affairs Test which seeks to measure a student's familiarity with contemporary arts, music, drama, radio and sports. The tests then may be useful tests and the college courses may be sound, and yet the relationship between tests and courses may vary within wide limits. With this understanding, this chapter sets forth briefly the apparent relationship existing between performance on the co-operative tests used in this investigation and courses taken by the students tested.

English

The co-operative English test is divided into sections on usage, spelling, and vocabulary. Scores on this test were reported in Chapter III¹ for Colleges A, B, and D. Each of these colleges has a required Freshman course in English composition that would presumably give adequate preparation for the usage section of the test. In the judgment of instructors in the English department of College A, all the test items on two forms of this test had been covered in the Freshman course. There is very little difference between the average scores of the colleges in May of the Freshman year. This similarity in score may reflect

¹Pp. 9-21.

the close parallel between the test and the course.

Only in College A is it possible to determine the gain made on this test score in the Freshman year, for only in that college was the test used as a pre-test in September of the Freshman year. Forty-four Freshmen there made a gain in that year of 6.5 scaled score units whereas they gained only 4.6 in the Sophomore, Junior, and Senior years together, a three-year period, when composition courses were not taken. Apparently, scores on this section of the English test are very definitely influenced by the course in composition. The scores in May of the Freshman year do not approach the maximum score possible closely enough to indicate that the smaller gains in the Sophomore, Junior, and Senior year are the result of students having approached the ceiling of the test.

No such parallel between the spelling and vocabulary sections of the test and any specific college course or courses can be presented. The type of learning measured by these sections is more general and proceeds in many courses and outside of any formal course of study. However, it is of interest to note that in the one college where pre-Freshmen scores are available, the students show a greater gain in spelling score during the Freshman year than in the other three years put together. This may well reflect an emphasis on spelling in English composition. On the other hand, the gain in the vocabulary score was spread more evenly through the four years. As vocabulary building in these colleges is expected to proceed as a concomitant of other learning throughout all four years rather than as a result of any single course, this more even spacing of gains may also reflect teaching emphasis.

Literary Acquaintance

In Colleges A, B, and D the survey course in English literature is usually taken in the Sophomore year. This is reflected by the fact that the average gain of the students of these colleges, when their scores are consolidated, is 4.5 scaled score units in the Sophomore year as compared to gains of 1.6 and 1.7 for the Junior and Senior years respectively.¹ The instructors in College A checked 34 per cent and 30 per cent of the

¹Table 9, p. 22.

items of two forms of this test as included in the Sophomore literature course content in that college. No check was made in other colleges.

The relationship of other literature courses taken during the Junior and Senior years as well as the Sophomore course is shown by a product moment correlation coefficient of $.52 \pm .06$ for semester hours in English literature and the scaled scores on the literary acquaintance in May of the Senior year for 58 students in College A. It is $.27 \pm .05$ for 121 students in College B. There is then a positive correlation between courses taken and status as measured by the test in the Senior year. The degree of that relationship varies from college to college.

The correlation coefficient for change in score from Freshman to Senior year and the number of hours in English literature for the same groups of students is only $.15 \pm .08$ for College A and $.25 \pm .05$ for College B. It has already been shown in Chapter IV¹ that there is no statistically significant positive correlation ($r = .09 \pm .04$) between scholastic aptitude and gain in the Literary Acquaintance Test score so that factor has not affected these correlation coefficients. So low a correlation need not be interpreted as evidence that students do not learn in these courses. It may mean only that the tests do not measure the particular learning that took place.

General Culture

The History and Social Science Section of the Co-operative General Culture Test presents items 43 per cent of which are covered in a required Freshman course in European Civilization in College A in the judgment of the instructor in that course. The fact that practically all students in this college study this material is probably reflected in the high average end-of-the-year Freshman score of this College in comparison with Colleges B and D in which no such Freshman course is taken by many students.² In College C most students take a similar survey course in the Freshman year and they also make a high score.

In College A the correlation between the number of semester hours in history and social science and gain in score on the test in the Sophomore year is $.23 \pm .08$. The correlation for the

¹Table 24, p. 44.

²Table 11, p. 24.

number of semester hours in history and social science taken during the four years of college and gain in test score in that period is $.22 \pm .08$

Students in College B make a much larger gain during the Sophomore year than in any other year and more than students in the other three colleges made in any year. Sixty-three of these students making an average gain of 4.2 points in raw score are reported as taking no course of any kind in history or social science during that year. Fifty-nine other students who took from two to nine semester hours in history and social science (55 took six hours) make an average gain of 17.7 points in raw score. The correlation coefficient for the relationship between course hours and change in score in the Sophomore year is $.41 \pm .05$. In this college, course work influenced the test scores favorably.

In College C where the number of quarter hours in history and social science in the Sophomore year ranges from 0 to 24, the correlation for the gain in score during that year and the number of course hours is $-.07 \pm .05$.

In College D 26 students who took no course in history or social science in the Sophomore year show an average gain in score of 8.1 points, while 14 students with an average of 4.4 semester hours in social science or history show an average gain of 9.4 points. Here again the courses seem to have little influence upon scores on the tests.

In some of the colleges participating, then, there is a much closer relationship between courses taken in social science and history and gain in scores on the History and Social Science Test for the same period than in other colleges. There are several possible explanations. It might be that in one college students of much lower aptitude major in social science than in the other colleges and that these students were less able to profit by instruction. But the correlation coefficient for relationship between change in scores on this test and scholastic aptitude was reported in Chapter IV as only $.03 \pm .04$. Scholastic aptitude, then, is not an important factor with the groups of students being considered. Again, there might be variation in the instructional efficiency among the colleges. There are no data available to check that. The most probable explanation in the mind of the investigator is that the tests do not parallel the courses in history and social science to the same degree in different

colleges. Apparently, many of the items in the tests represent information that is learned, if at all, outside of the courses in this field. The learning measured by the tests may be very desirable learning, but the scores should not be construed as a measure of success in instruction in specific courses except where there is a demonstrated parallelism of content.

Foreign Literature

A study of the individual data cards for students in all four colleges did not reveal any courses that seemed to be related closely enough to the foreign literature test items to warrant comparison of course hours with test scores. In the judgment of instructors in College A as expressed by checking the tests, only 18 per cent of the items in this section of the General Culture Test would have been covered in required courses by the end of the Sophomore year. It was estimated that majors in history would have covered 41 per cent of the items in course by the end of the Senior year. The items in this section of the test are drawn from wide areas of literature, history, philosophy, and religion, acquaintance with which is made in many courses of study and through independent reading.

Fine Arts

The items in this section of the test were drawn from many of the fine arts. It is difficult to determine which courses offered by these colleges might be expected to cover the area of knowledge sampled by this test.

In College A the course offerings in this field are meager and students make less gain in score than do students in the other three colleges. In the Senior year, 20 students who took an average of 3.5 semester hours in either aesthetics or music appreciation gain only .1 of a point more in test score than do 41 students who took no course in this area during the Senior year.

Of the 120 students of College B for whom four years of test scores are reported, only 10 have credit for courses in art. These ten took an average of 14.2 semester hours and make an average gain of 24.5 raw score points from Freshman to Sophomore year. The 110 students who took no courses in art during that

period make a gain of 23.1 points in the same length of time. Apparently, in this institution the gains in the test scores in fine arts are the result of something else than formal course instruction in that area.

In College C where students register the greatest gain in this test these interesting facts appear. Seventy-one students with no art course in the Senior year (the year in which the greatest gain is registered) gain an average of 8.5 in test scores in that year. Sixty-seven students with an average of 7.1 quarter hours in art or music appreciation gain 20.3 in the same year. Apparently, in this college the art courses do tend to increase the gain in test scores. Yet, in this particular institution, the success of the course instruction as reflected in the test scores varies with the psychological quarters. In the highest quarter 23 students with no art course in the Senior year gain 8.5 in score, while 27 with an average of seven quarter hours in art or music gain 24.8 in score. In the lowest quarter, however, 15 students with no art or music course gain 9.1, while 10 students with an average of 9.2 quarter hours of art or music gain only 8.7. The sampling is too small to be reliable, but these particular students of low scholastic aptitude did not improve their score in this test when they took courses of instruction in this area in the Senior year. A similar situation did not appear in a study of the scores in the other colleges.

In College D, of the 38 students for whom scores are reported, only 6 took any course in art or music in the Senior year. These six average a gain of only 1.5 more in raw score during the Senior year than do the 32 students who took no art or music course.

In the discussion of the preceding paragraphs, it has been shown that in Colleges A, B, and D the amount of gain in test scores on the fine arts section of the test in general culture is not significantly affected by the hours taken in courses listed as art or music. In College C the scores are definitely affected, but more so for students in the top psychological quarter.

With this test, then, as with the others discussed, the test items parallel the course content in these colleges to too slight a degree to justify using the test as a measure of achievement in a particular course. The test does not attempt to evalu-

ate the student's appreciation of the art, literature or music he is asked to identify, and therefore is weak at that point. It is useful, however, in securing a wide sampling of the student's ability to identify facts in this field of general culture.

Contemporary Affairs

The effort to discover the relationship between test and course offerings is even less rewarding in regard to the Contemporary Affairs Test than with the other tests. The nature of the test must be kept in mind. It is in two parts: one called Public Affairs and the other Aesthetics. In the 1936 form, for example, Part I, Section I, includes eight groups of from 10 to 15 items each with the following headings: National Political and Other Public Personalities (3 sections have this heading), International Political and Other Public Personalities (2 sections have this heading), Personalities in Sports, Other Personalities (the items include heads of national foundations, scientists, editors, etc.), Geographical Location (largely identification of cities. Section 2 includes 3 groups of 125 items in all concerned with current legislative, economic and political situations which appeared in the press and magazines. Section 3 contains 23 items in the same field, many of which call for the recording of a personal judgment in the answer.

To the present investigator, such items as these are significant in revealing the alertness of the college student in his general reading and awareness of the current situation. At least, it may measure the breadth of his acquaintance with contemporary life if not his depth of understanding of its significance. The scores of a group of students on this test may be one indication of the extent to which the spirit of a college is contemporary and the degree to which students are stimulated to relate their formal training to the needs and opportunities of today. No proof is offered for this assumption. The test does not seem to be sufficiently related to any single course or any group of courses given by these colleges to justify the use of statistical comparisons.

Part II of the test called Aesthetics has even less relation to course offerings. That it measures something different than Part I is shown by the fact that College A stands much the

highest in initial score on Part I and the lowest of the three colleges on Part II.¹ In the 1936 form of the test Part II includes Section 1: Personalities in Literature, Drama, Art and Music (100 items). Section 2: Books (52 items), Plays (15 items), Cinema (26 items), Music (14 items), Art (4 items), Terminology (6 items).

This part of the test seems to be useful as a measure of the functioning interests of the student rather than as a measure of knowledge acquired through formal college courses. Therefore, no attempt is made in this report to show how scores on this test were affected by courses of study. It may be added, however, that one's philosophy of education and of life would affect his interpretation of scores on Part II of the Contemporary Affairs Test. It is conceivable, for example, that a perfect score on the items included under Plays and Cinema might indicate, among other things, an absorption in amusements that might be considered undesirable.

Summary

The varying relationship which exists between the co-operative test scores and the courses of study taken by students tested in these colleges might be a result of wide variation in instructional success from college to college and from course to course, or it might be a result of variation in the degree to which test items parallel the content of the courses. Both factors may well be present. No data are available to check teaching effectiveness. However, it seems reasonable to believe in the absence of other evidence to the contrary that the greater discrepancy is between test items and courses of study. Therefore, caution must be used in the interpretation of the results.

It does not follow that the tests are not measuring knowledge which it is desirable for college students to acquire. Perhaps these colleges should expand their offerings to include all the knowledge sampled by these tests. That is for the colleges to decide.

On the other hand, it may be true that in some of the courses of study, the teaching emphasis is upon principles and the cultivation of higher mental processes rather than upon memo-

¹Tables 17 and 19, pp. 34 and 36.

rization of facts. Students so taught might be at a disadvantage in writing these tests.

At present, these tests with exceptions such as English usage which have been noted, are most useful in these colleges to evaluate learning which apparently results from the whole experience during the college years rather than from particular courses. In part, the gains may be a result of maturation which might be the experience of persons in this age period who were not even following a college curriculum. The tests also offer an instrument for checking progress from year to year in certain phases of general education and for comparison of the performances of students in one institution with that of a nationally representative student population.

CHAPTER VI

THE RELATION OF ACHIEVEMENT OF CHARACTER OBJECTIVES TO SCHOLASTIC APTITUDE AND SCHOLASTIC ACHIEVEMENT

Church-founded colleges of liberal arts have been particularly concerned with the development of character or effective Christian personality as well as scholarship. Their appeal to their church constituency for funds and for students is based upon that supposition. The advocates of the church college believe that it is succeeding better in this field of character education than is the publicly supported college or university. The critics of the church college on the other hand feel that it is achieving only indifferent success in this field and that in this respect at least there is no justification for its maintenance.

It is surprising in view of the importance of character education in the philosophy of the church college that there has been so little serious effort to measure achievement in this field. While some students are eliminated from college because of certain types of character defects that compel administrative attention, such as gross immorality, cheating, dishonesty, etc., nevertheless, church colleges often admit students, advance students and graduate students upon criteria that have no demonstrated relationship to character.

This practice has been followed either on the assumption that grades in courses or scores on examinations were a valid index to character achievement as well; or that it is not possible to measure in this area of "intangibles"; or that it is not desirable to consider character in grading.

This chapter reports an attempt made in one of the four colleges contributing data, Aurora College, to study this problem. The technique developed is described in detail.

Aurora College is committed in its printed announcements and by its administrative emphasis to the development of Christian

character. The faculty has been selected with that factor in mind.

The first step in the procedure was to ask the faculty through an appointed committee to formulate as specifically as possible the character objectives of the college in terms of behavior. Some months were spent in the study of the literature and rating devices available and in a careful definition of character objectives.^{1,2,3,4,5,6,7,8,9} That list of objectives was then placed in the hands of faculty members interested, and they in turn suggested lists of behavior items or of desired qualities under each objective. The committee eliminated duplications, refined phrasing, and submitted a comprehensive list of categories and items to the faculty.

The first form of a Character Rating Scale with which students might be rated was then constructed, care being taken to describe the steps on each item so that they would have the same meaning for each rater. This form included the following general character objectives:

¹Erland Nelson, "Attitudes Sought by Colleges," School and Society, XLVI (October 2, 1937), 444-446.

²Hugh Hartshorne, Character in Human Relations. New York: C. Scribner's Sons, 1932. Pp. xiv + 307.

³Percival M. Simonds, Diagnosing Personality and Conduct, pp. 41-114. New York: D. Appleton, Century Co., 1931.

⁴L. D. Hartson, "Further Validation of the Rating Scales Used with Candidates for Admission to Oberlin College," School and Society, XLVI (July 31, 1937), 155-160.

⁵J. J. Smith, "The Problem of Building a Character Test on the College Level," A College Looks at Its Program, pp. 210-220. New Concord, Ohio: Muskingum College, 1937.

⁶Gordon W. Allport, Personality: A Psychological Interpretation. New York: Henry Holt and Co., 1937. Pp. xiv + 588.

⁷Ralph W. Tyler, "Techniques for Evaluating Behavior," Educational Research Bulletin, XIII (January 17, 1934), 1-11.

⁸Harold O. Rugg, "Is the Rating of Human Character Practicable?" Journal of Educational Psychology, XII (November and December, 1921), 425-438, 485-501; XIII (January and February, 1922), 30-42, 81-93.

⁹"Manual for Behavior Description," The Reports and Records Committee of the Commission on the Relation of School and College. Progressive Education Association. (Mimeographed.)

1. A Christian philosophy of life.
2. Desirable social relationships.
3. Satisfactory emotional adjustment.
4. An insight into the nature and application of good thinking.
5. Sound health and attractive appearance.
6. Effective work habits and attitudes.
7. Rewarding leisure time interests and skills.
8. Sound attitude toward property.

Each of these objectives was broken down into from five to eight forms of behavior or attitudes that could be described with a reasonable degree of objectivity. For each form of behavior, a five point scale using descriptive terms was devised. In all, there were 81 items upon which rating was to be recorded.

This scale was scored for a small sample of Seniors selected as probably representing markedly different levels of character achievement. Ratings by eleven faculty members for six Seniors were secured.

A study of the scores showed that the scale did discriminate. There was a wide spread between the scores of the highest and of the lowest Senior. Out of a possible perfect score of 324, the highest score was 232 and the lowest was 150; a range of 82 points.

There was also a marked agreement in the independent ratings. Nine of the eleven teachers deviated from the mean of the scores by less than 10 per cent of the score. Eight of the teachers deviated from the mean 7 per cent or less.

However, it was found that for some items the teachers had an insufficient basis for judgment, that some items were interpreted differently by the different raters, and that other items did not add to the discriminative value of the scale. It was also found that the form of the scale which made it convenient to score each student on every item in the scale before considering the next student contributed unduly to the "halo" effect.

The unsatisfactory items were eliminated and a revised form of the scale was adopted in which the number of items was reduced to 40 grouped under seven categories.

Character Objectives

- I. A Christian Philosophy of Life.
 - Professed Christian faith.
 - Participation in public religious life.
 - Concern for the social implications of Christianity.
 - Moral discrimination.
 - Kindness in judging others.
 - Tolerance.
 - Courage to act on convictions.
 - Life as an opportunity to be of service.
- II. Desirable Social Relationships.
 - Friendliness.
 - Attitude toward opposite sex.
 - Social etiquette.
 - Sportsmanship.
 - Ability to lead.
 - Appreciation of favors.
 - A desire to serve people.
- III. Satisfactory Emotional Adjustment.
 - Adequate emotional life.
 - Disciplined emotions.
 - Ability to stand up to life.
 - Enthusiasm.
 - Fair self rating.
- IV. Insight into the Nature and Application of Good Thinking.
 - Sound judgment.
 - Curiosity.
 - Discrimination.
 - Understanding the unity of knowledge.
 - An appreciation of the significance of the scientific method.
- V. Sound Health and Attractive Appearance.
 - Physical vitality.
 - Cleanliness (grooming).
 - Freedom from sickness.
 - Sound attitude toward recreation in relation to health.

VI. Effective Work Habits.

Use of time.

Accuracy.

Initiative.

Persistence.

Pride in fine work.

Full use of capacities.

Willingness to accept responsibility.

VII. Rewarding Leisure Time Interests and Skills.

Discrimination in choosing amusements.

Skill and interest in sports that will be available after college.

Real appreciation of art, music, drama, nature, etc.

Love of reading (level, amount)

In order to reduce the "halo" effect, the score sheet was so devised that it was most convenient to rate all students on a single item before considering the second item. The descriptions of the behavior to be identified were given on a separate sheet and numerical values from 0 to 4 were assigned to the steps on the scale. The rating sheet, the descriptive scale, and the manual of instructions are found in the appendix.

Eight members of the faculty rated 93 graduates of the years 1936-1940. Four years of association with students in a college of less than 200 students where there is one teacher to every nine students presumably gives an adequate opportunity to know students as intimately as is required to use with discrimination such a rating scale. A study of the rating sheets showed that for six of these students the ratings in a number of categories were incomplete and the total scores were not comparable with the ratings for other students. These six were students who had transferred to Aurora College as upper classmen, and the faculty raters were not as intimately acquainted with them. They were dropped from the study leaving 87 students for whom there were from five to eight independent faculty ratings on each of the 40 items. The scores were tabulated and the mean of the ratings on each student found. This average of from four to eight faculty ratings is considered the Character Rating Score of the student.

It appears that the rating scale does discriminate and

that it measures qualities or achievements that are distributed approximately in accordance with the normal curve. Using the Chi square method for determining the goodness of fit, the value of χ^2 for this distribution indicates a value of p. of .412. In other words, there are more than 41 chances out of a hundred that the fit obtained would be as bad or worse than the one shown. The distribution is then approximately normal. The lowest student score is 51, the highest is 133, giving a range of 82. The mean is 93. The standard deviation is 17. The possible range was from 0 to 160.

The distribution of scores for the entire scale and for each of the seven sections of the scale are given in Figures 21 and 22.

The reliability of the scale as a rating device was then checked. The mean deviation in the scoring of each rater from the mean of all the ratings (4 to 8) for each student was computed. Table 36 gives the results for the four faculty members who rated all 87 students on practically every item. The other

TABLE 36

DEVIATION OF INDIVIDUAL RATINGS FROM THE MEAN
OF ALL RATINGS IN USE OF CHARACTER RATING
SCALE FOR EIGHTY-SEVEN STUDENTS

Rater's Identi- fication Number	Extreme Scores of Ratings Given	Range of Scores	Average Number of Points Deviation in Total Score Per Student	Percentage of Deviation in Terms of Rater's Own Range
1	58-143	85	6.7	8
4	48-147	98	10.6	11
5	41-147	106	10.6	10
8	60-145	85	10.3	12

four faculty members did not rate every student, as they were instructed to give no rating when uncertain. For the students whom they did rate, the deviation was not significantly greater than that reported for the other four. The product moment coefficients of correlation for the mean of the ratings by all raters and the individual ratings by each of the raters who had scored every

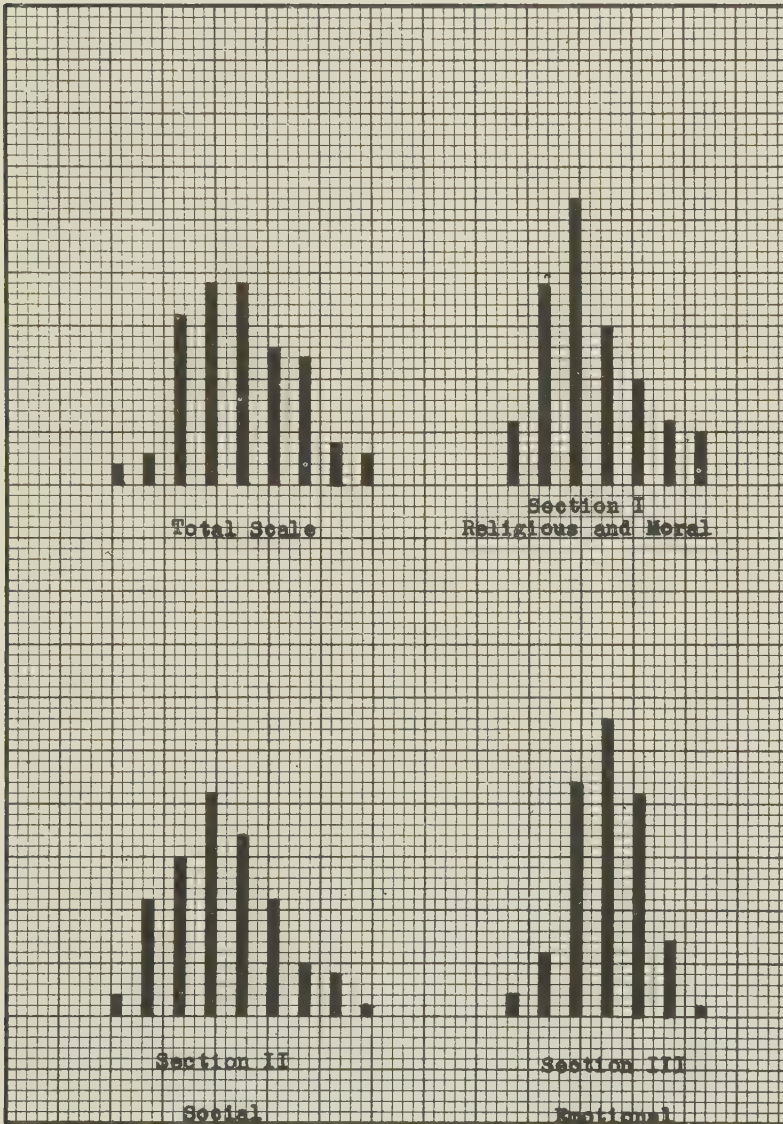


Fig. 21.--Distribution of scores for total Character Rating Scale and for sections I, II, III.

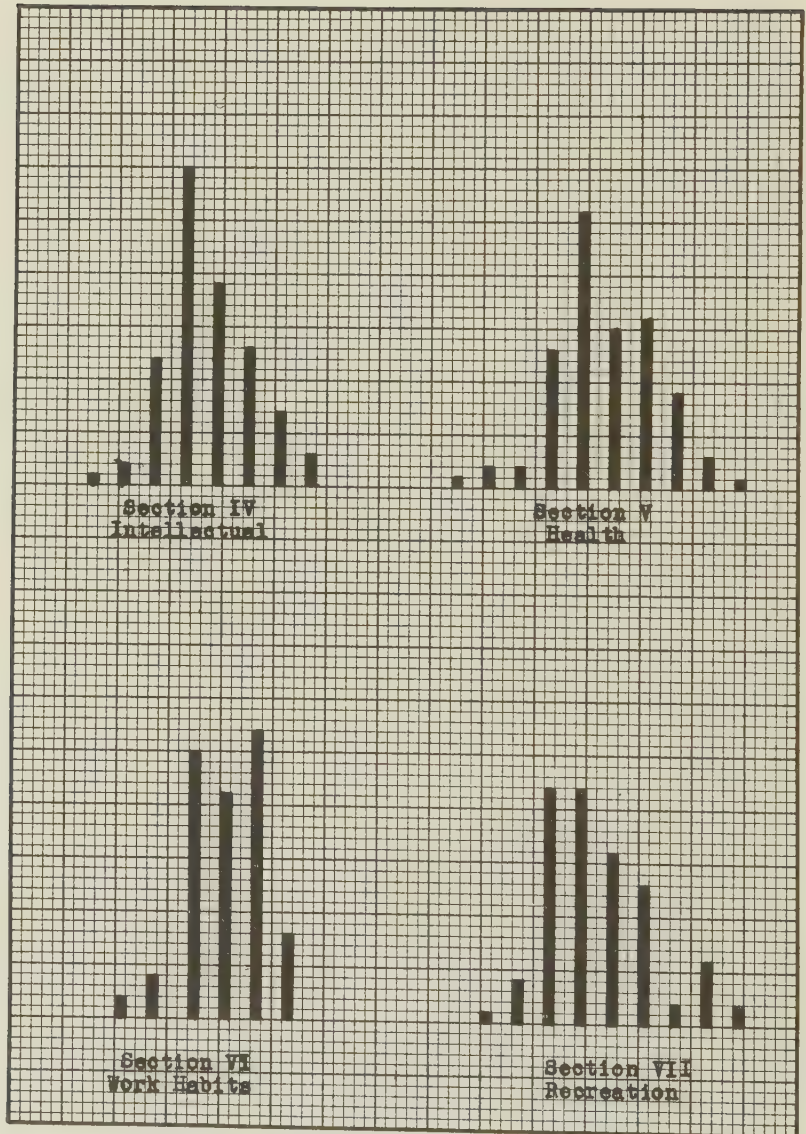


Fig. 22.--Distribution of scores for sections IV, V, VI, VII of Character Rating Scale.

student are given in Table 37. The relatively small size of the deviations in score and the relatively high correlations which are both reports of the same function indicate that the scale is sufficiently reliable to be used in this study.

To check the validity of such a scale is difficult because of the lack of comparable instruments. In one sense, there is nothing more valid than a discriminating and objective judgment. In the preparation of the scale and in its administration, steps were taken to safeguard the ratings against "halo" effects, "the acquaintance factor" and other factors that might interfere with valid ratings. The definitions of the forms of behavior that constituted the scoring points were worked out carefully to avoid ambiguity.

TABLE 37

CORRELATION COEFFICIENTS FOR MEAN OF
RATINGS BY ALL RATERS AND INDIVIDUAL
RATINGS FOR EIGHTY-SEVEN STUDENTS

Professor No. 1	0.84±0.02
Professor No. 4	.83± .02
Professor No. 5	.83± .02
Professor No. 8	0.75±0.03

In an effort to test its validity, volunteers were sought in the class of 1940 to rate their fellow class members. Four students responded and the correlation of the average of their ratings of 24 students with the average of the ratings by the faculty members is shown in Table 38 for the complete scale and for each section.

The lowest correlation is found in the sections on desirable social relationships and sound health and attractive appearance. It is to be expected that faculty and student viewpoints would be different in these areas. However, the relatively high figures for the other correlations give justification for reasonable confidence in the validity of the scale.

In a further effort to check the validity of the scale, the highest ranking ten and the lowest ranking ten of the 87 students were compared on the basis of their performance and attitudes after graduation. At the time of the comparison, these

students had been out of college for periods ranging from 5 months to 4 1/2 years. In every case but three the investigator had been in close enough touch with these graduates to pass valid judgments. For these three, other sources of information were consulted. In the following sentences these students will be called the high group and the low group.

TABLE 38

CORRELATION BETWEEN MEAN RATINGS GIVEN BY EIGHT
FACULTY MEMBERS AND MEAN RATINGS GIVEN BY
FELLOW-STUDENTS TO TWENTY-FOUR STUDENTS

Complete Scale (40 items)	0.77±0.05
I. A Christian Philosophy of Life (8 items)	.87± .03
II. Desirable Social Relationships (7 items)	.56± .09
III. Satisfactory Emotional Adjustment (5 items)	.78± .05
IV. Insight into the Nature and Applica- tion of Good Thinking (5 items) . . .	.77± .05
V. Sound Health and Attractive Appear- ance (4 items)	.68± .07
VI. Effective Work Habits (7 items)	.89± .03
VII. Rewarding Leisure Time Interests and Skills (4 items)	0.70±0.06

Some of the most striking bits of evidence known to the investigator must be omitted lest the person be so clearly identified as to be recognizable by some who may read this report. Enough data can be given, however, to establish the validity of the scale.

Of the high group, all ten are giving evidence of vital Christian character. Eight of the ten are noticeably active in Christian service. One is giving constructive leadership in the ministry and another is in training for the ministry. Four are giving full time to teaching in a Christian college or are in graduate training for that work. All of the others except two are giving conspicuous service as laymen in Christian work with young people.

On the other hand, of the low group, only two could be characterized as aggressively Christian in personal life or service.

The second general category of the Character Rating Scale is Desirable Social Relationships. Of the high group, two are

happily married, one is engaged, and all ten can be classed as maintaining desirable social relationships as defined in the scale.

Of the low group, four are married. At least two are with inadequate resources and with little promise of the best type of home situation. Of the ten, four would be classed as unsatisfactory in their present social relationships as defined by the scale.

There is nothing but the observation of the investigator to validate judgments under the third category of the scale, Satisfactory Emotional Adjustment. The items here are adequate emotional life, disciplined emotions, ability to stand up to life, enthusiasm, fair self rating. Seven of the high group would rate excellent and the other three good on these items in their post-college performance.

In the low group, all ten would rate low on some of the items and three would rate low on all five items.

In studying the validity of the intellectual category of the scale called Insight into the Nature and Application of Good Thinking, including the items of sound judgment, curiosity, discrimination, understanding the unity of knowledge, and appreciation of the significance of the scientific method, the correlation was computed for the relation of raw score on this section with equated raw score on the Thurstone Psychological Examination taken during Freshman week. The coefficient was $.38 \pm .07$.

One explanation of this low correlation may be that the items on the scale measure different intellectual abilities than do the scholastic aptitude tests. Observation leads to the belief that in life there is often very little positive relation between open-mindedness and common sense and scholastic aptitude.

That a high score on the scale as a whole does identify the persons who have the mind and will, however it may be defined, to succeed in academic endeavor is shown by the fact that seven of the ten in the high group have successfully carried graduate work in university or professional school. The majority of them have made distinguished records. Two of the three who have not entered graduate school are now working and saving money for that purpose.

From the low group, only one has undertaken graduate work and that one fitfully.

The effective work habits of the high group have carried over into post-college situations while the less desirable work habits of the low group seem to have followed them too.

The behavior of the members of these two groups after college in the matter of leisure time interests and skills has directly validated the rankings given them.

An interesting validation comes from a different source and is objective.

Of the ten members of the high group, only one student had his college expenses paid in full by parents. The other nine had to earn more than half their expenses. Four of them had to assume the full responsibility for their college expenses. Six of these students owed the college substantial sums at graduation. All except one very recent graduate paid the account in full in less time than the college expected. They were persons of integrity and self discipline.

Of the ten members of the low group, seven had practically all their expenses paid from home. One of the others left a large college obligation and has made no effort to meet it.

Of the high group, nine of the ten had positions or had been accepted for graduate work in other institutions within thirty days of graduation from Aurora College. They were clearly persons of purpose and drive.

Of the low group, only two had found a position or assumed definite responsibilities within that time.

At Aurora College, Senior awards are made for consistently high scholarship. There is also a single award known as the Spartan Award for all-around achievement in character and service. This award is made upon nomination of the members of the Junior class. This nomination is reviewed and confirmed or rejected by a committee of the faculty. Only one member of that faculty committee participated in the scoring on the rating scale reported in this chapter. Thus the Spartan Award was made each year entirely independent of the use of the rating scale. The scholarship awards are based on marks made in courses. Therefore, the awarding of neither type of Senior recognition has any direct relation to the character rating project.

It points, therefore, to the validity of the Character Rating Scale that 9 of the 10 students in the high group of students as measured by the scale received either the Spartan Award

or the scholarship award, while not a single one of the low ten received either recognition.

Enough evidence has been presented to justify the use of the Character Rating Scale experimentally in measuring the kind of character that this college considers important. High scores on the scale have identified the kind of persons who express in life the character qualities desired.

Assuming, then, that measurement by means of this Character Rating Scale is sufficiently reliable and valid to be useful, the next paragraphs discuss the relation that character achievement as measured by this scale bears to co-operative test scores.

The relationship between score on character and score made on the A.C.E. Psychological Examination during Freshman week is expressed by a product moment correlation coefficient of only $.17 \pm .08$. This is not positively significant. It is recognized that the scores on the psychological examination would probably have been higher if it had been given again in the Senior year. It is doubtful, however, if the position of students in the group would change enough to alter significantly the correlation with character scores.

The correlations between character scores and co-operative test scores taken in May of the Senior year are given in Table 39.

TABLE 39

CORRELATION COEFFICIENTS FOR THE RELATION OF
CHARACTER SCALE RATINGS AND SENIOR YEAR
SCORES IN CO-OPERATIVE TESTS

N	Name of Test	Correlation Coefficient
58	Character Scale and Total English Test	0.27 ± 0.07
58	Character Scale and Literary Acquaintance Test	$.27 \pm .07$
62	Character Scale and History and Social Science Test	$.21 \pm .07$
62	Character Scale and Foreign Literature Test	$.25 \pm .07$
62	Character Scale and Fine Arts Test	$.18 \pm .07$
42	Character Scale and Public Affairs Test . .	$.37 \pm .09$
42	Character Scale and Aesthetics Test	0.02 ± 0.10

These coefficients are all very low or without positive significance except the one for character and public affairs.

As this study is more concerned with the progress of students through the college years rather than their status at a given point, correlation coefficients are reported in Table 40 for the relationship between gains in score from May of the Freshman year to May of the Senior year in the various tests and character ratings. These coefficients are too low to be of positive significance. Because the scores on the later forms of the tests are not always strictly comparable section by section with the earlier forms, the number of test scores from which the correlations could be computed are sharply reduced for public affairs and aesthetics. The correlation coefficient for only 22 cases is not reliable.

TABLE 40
CORRELATION COEFFICIENTS FOR THE RELATION OF
CHARACTER SCALE RATINGS AND THREE-YEAR
GAINS IN CO-OPERATIVE SCORES

N	Name of Test	Correlation Coefficient
58	Character Scale and Gains in Total English Test	0.08±0.08
58	Character Scale and Gains in Literary Acquaintance	.18± .08
62	Character Scale and Gains in History, Social Science	.04± .08
62	Character Scale and Gains in Foreign Literature	.01± .08
62	Character Scale and Gains in Fine Arts . . .	.03± .08
22	Character Scale and Gains in Public Affairs	.15± .15
22	Character Scale and Gains in Aesthetics . .	0.12±0.15

Important qualifying statements must be made at this point. It is recognized that the administration of the scale in this study measured status at the time of graduation and not the progress to that point. If it had been possible to rate these students twice at two or three year intervals, that would have been desirable. As it is, the study offers no evidence as to the character status of these students at the beginning of their college experience. Therefore, no attempt is made to state what part of their score at graduation can be attributed to their

college life.

The other limitation is in the nature of the character objectives themselves. They do not include all the desirable intangibles. They do represent those categories that members of this particular college faculty considered important and were at the same time items upon which these teachers felt that they could give discriminating ratings.

Summary

In this chapter the results have been reported of the construction and administration of a scale for the rating of character as defined by the faculty of one college, Aurora. It has been shown that in this particular institution there is no substantial correlation between character rating scores and scholastic aptitude, or between character rating scores and co-operative test scores made in May of the Senior year or between character rating scores and gain in co-operative test scores between Freshman and Senior testing. Apparently, the rating scale measures something quite different than do the co-operative achievement tests. In this college "character" as measured by this scale is not distributed among students in positive relation either to scholastic aptitude or to intellectual achievement, in so far as such achievement is measured by the co-operative tests.

Such conclusions challenge the institution to examine its program in the light of the objectives sought. Scholarship and character are not necessarily concomitant. It is important, then, for the college to seek to discover why so many of the ablest students intellectually fail to develop a correspondingly strong character.

Of greater educational importance than the scores obtained in this institution, and the implications of the record for it, is the report of the development of a technique which might have much wider use. No claim is made for the usefulness of this particular scale outside of the college for whose objectives it was framed. It is suggested, however, that the method used is sufficiently promising to justify the experimental preparation and use of similar scales in other institutions committed to the character building objective.

CHAPTER VII

OTHER FACTORS IN INDIVIDUAL ACHIEVEMENT

The study of the achievement by groups of college students reveals trends and permits generalizations that are important. Some of these generalizations for the colleges involved in this study have been pointed out in previous chapters. There is a steady gain in achievement test scores from year to year for the student population, but there is great variation in performance within that large group. The group gains are approximately equal in each psychological quarter, and the typical student who makes a low psychological score does not overtake his better endowed classmate. Achievement on the tests is not a direct function of the curriculum followed. Achievement in character as measured by the scale devised is not directly associated with scholastic achievement.

That these generalizations must apply to a particular student is not expected. There are clearly other factors that may affect achievement. There are many atypical students, and they may constitute a serious educational problem. Why do they depart from the pattern of the theoretical average student?

In facing that question, a number of other factors which research or significant educational opinion have suggested as important were considered.^{1,2,3} The factors listed below were studied for each of sixty graduates of Aurora College. These students were sixty of the eighty-seven included in the study of the previous chapter, and were selected because sufficient data were

¹Ruth Strang, Personal Development and Guidance in College and Secondary School, pp. 92-105. New York: Harper and Bros., 1934.

²David Segal and M. M. Profitt, Some Factors in the Adjustment of College Students, pp. 13-35. Washington, D.C.: U.S. Office of Education, 1937.

³Kenneth L. Heaton and Vivian Weedon, The Failing Student. Chicago: The University of Chicago Press, 1939. Pp. vii + 286.

available for each of them.

Each of these students received the Bachelor's degree and, in that sense, succeeded in his college experience. The usual approach to the "failing student" was not appropriate. On the other hand, beyond meeting the minimum requirements for graduation, there were wide differences in scholastic achievement. Then, too, this investigation is concerned with attainment of character as well. The aim of the college program is supposed to be the largest possible development of the complete personality.

The factors considered were:

1. Scores in Freshman, Sophomore, Junior, and Senior years in co-operative tests.
2. National percentile rank in scholastic aptitude test.
3. Grade point average based on marks earned in college courses.
4. Vocational motivation.
5. Rank in character rating.
6. College major.
7. Hours spent weekly in employment.
8. Degree of extra-curricular participation.^{1,2}
9. Physical health.
10. Emotional health.
11. Religious background of home.
12. Associates while in college.
13. Degree of purposeful self-direction.
14. Living arrangements while at college.

An attempt was made to treat these factors statistically, but it was not fruitful. Instead, the individual students were considered one by one with regard to such of these items as applied to each case.

Figures 23 through 52 present the intellectual record of each of these students graphically. The character rating, the scholastic aptitude, the grade point average and the co-operative test scores for each year are presented. The students are

¹Review of Educational Research, VI, No. 1 (February, 1936), 113-114.

²Theodore P. Stephens, "Extra Curricular and Other Student Activities at Aurora College." Unpublished report to the faculty, Aurora, Illinois, 1937. Pp. 60.

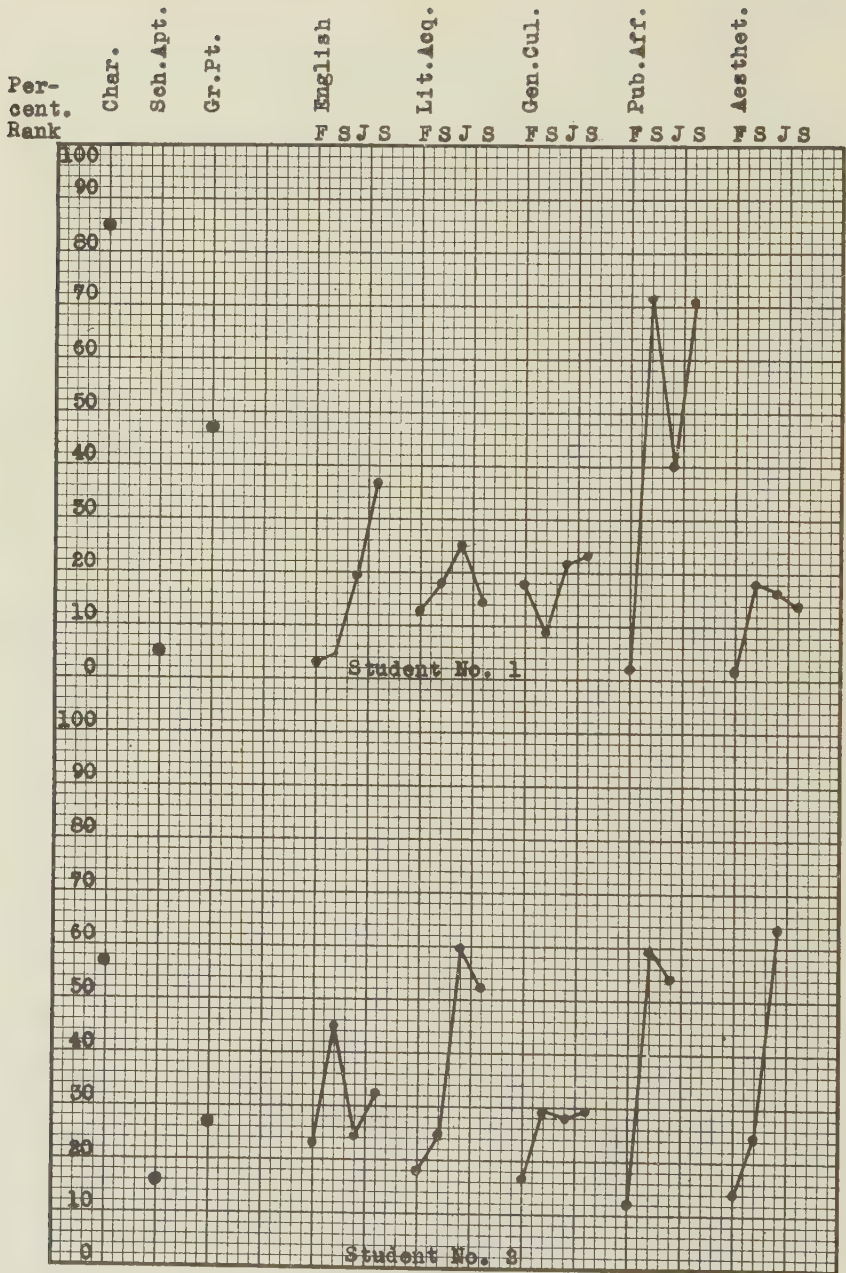


Fig. 23.--Profile charts of individual students

arranged in order of scholastic aptitude beginning with Figure 23 with the student having the lowest aptitude as No. 1.

This figure should be read as follows: Beginning at the left of the upper half of the figure it is seen that student No. 1 stands at the 85th percentile in character, as represented by score on the Character Rating Scale, at the 4th percentile in scholastic aptitude (A.C.E. Psychological Examination), and at the 47th percentile in grade point average as determined by instructors' course marks. In co-operative test scores in English, he ranked at the 3d percentile, the 5th percentile, the 19th percentile, and the 36th percentile in the Freshman, Sophomore, Junior, and Senior years, respectively. The percentile ranks for scores in the tests in literary acquaintance, general culture, public affairs, and aesthetics are read in the same way.

The percentile ranks in character and grade point average of instructors' marks are based on the group of 85 students for whom the character scores were reported in Chapter VI. The other percentile ranks are based on national norms as reported in the preceding chapters. However, while the percentiles are thus based on different groups, they are roughly comparable because the distribution of national percentiles in this group of students ranges from 3 to 100.

Attention is called to the evidence of correlation between scholastic aptitude and test scores in the general upward trend of the initial test scores from Student No. 1 to Student No. 60. The contrast between the test performance of the lowest two students and the highest two as ranked by scholastic aptitude score is seen clearly if Figure 23 and Figure 53 are compared directly. An inspection of these charts reveals, with great individual variation, general progress from the Freshman year to the Senior year, and on levels of attainment roughly corresponding to the aptitude level.

To emphasize the complexity of the problem of varying achievement and to point out certain important factors that must be considered in any program of evaluation, a paragraph will be devoted to each of thirty of these students.

Student No. 1 with a scholastic aptitude score on the A.C.E. Psychological Examination (1936 Form) at only the 4th percentile, nevertheless, earned a grade point percentile rank of 47 (B-) and made a very substantial gain in three of the five areas

in which he was tested. He earned all of his college expenses, often working as many as forty hours a week. He was active in extra-curricular activities, including football. He earned the respect of the student body and held important offices. He is an example of one who seemed to make the largest possible use of limited native endowment. His vocational goal, the ministry, was clear the first day he stepped on the campus, and was held to in spite of the misgivings of faculty counselors concerning his choice. He was never in doubt about that purpose. It is not surprising that he was ranked at the 85th percentile in character. For him, a mastering Christian purpose and excellent health were the two most important factors in a successful college experience. He is now a growing minister.

Student No. 2 with a scholastic aptitude percentile rank of 6, a grade point average at the 17th percentile (C), likewise showed a substantial gain in all testings. The factors in a reasonably successful college experience were probably financial help from home, moderate extra-curricular activity, and a willingness to work patiently at every assignment presented. The emotional life seemed thoroughly normal. The student lived at home. The vocation of teaching was decided upon before entering college. The character rank was 46. This student is now a successful elementary school teacher.

Student No. 3 with a scholastic aptitude percentile rank of 12 and a grade point average at the 3d percentile (C-), registered very little progress in the tests. The freedom of a college after the restrictions of a very conservative home seemed to induce a general sense of irresponsibility. Unsatisfactory as a college student employee, this student was content just to get by in all activities. He ranked at the 2d percentile in character. He had no clear vocational goal. He went through college with a minimum of effort. It is not clear that the college experience was a benefit to him.

Student No. 4 with the same scholastic aptitude percentile rank of 12 made a grade point average at the 43d percentile (B-) and showed very large gains in the tests. Her high initial scores and her gains in the English field put her well toward the top of the entire group. Assisted by employment provided through the National Youth Administration, she showed from the beginning a capacity for self-direction and painstaking work that resulted in

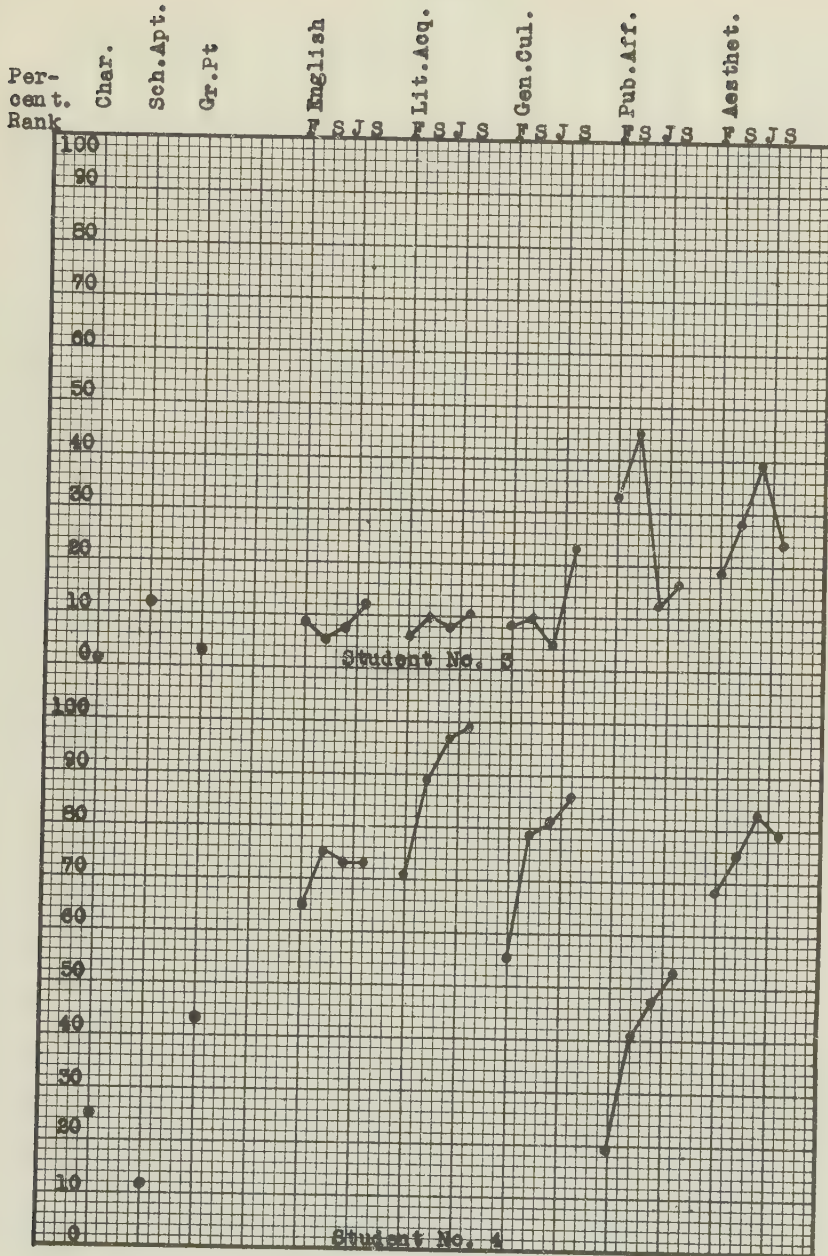


Fig. 24.--Profile charts of individual students

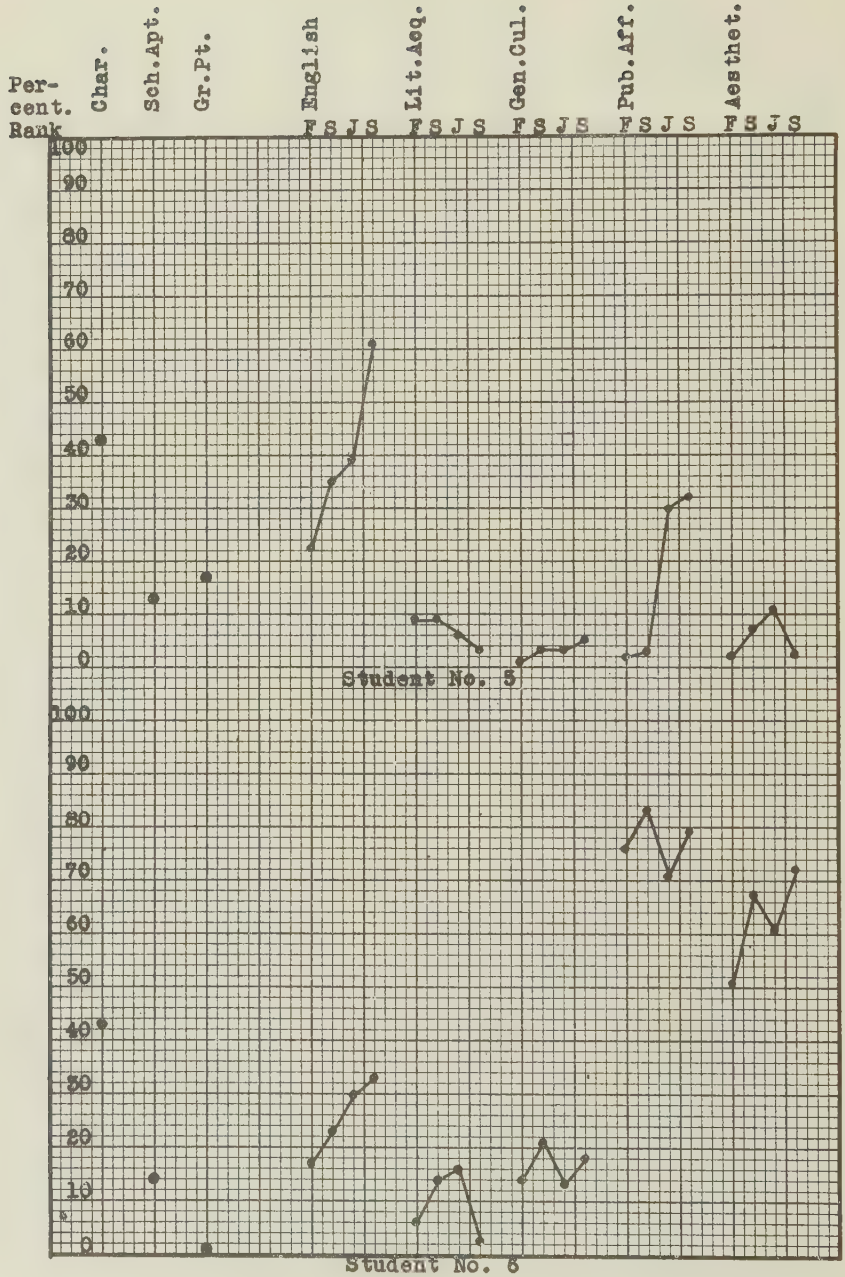


Fig. 25.--Profile charts of individual students

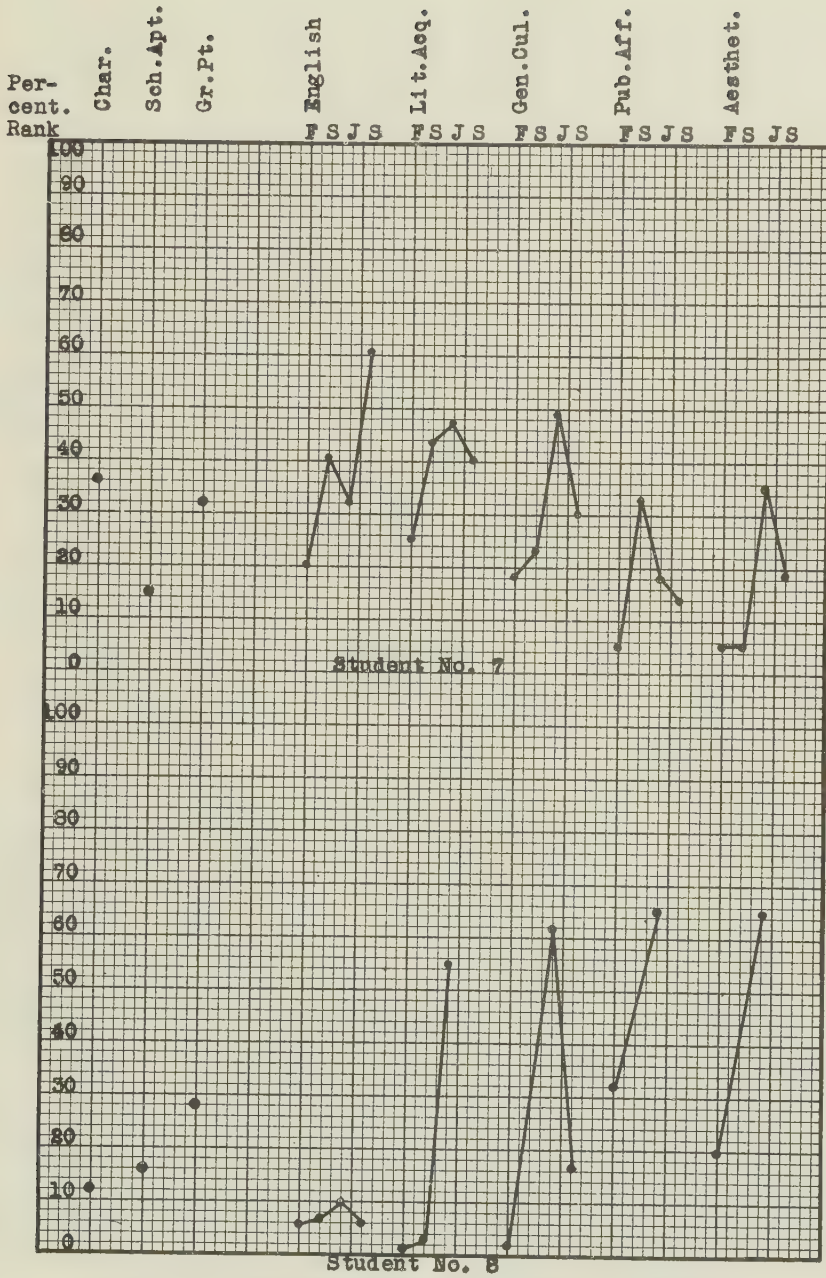


Fig. 26.--Profile charts of individual students

unexpectedly high achievement. She participated in extra-curricular activity to a reasonable degree. Her sense of privilege in the opportunity of attending college gave drive to her efforts. She is now holding a responsible clerical position.

Student No. 5 with a scholastic aptitude percentile rank of 14 and a grade point average at the 17th percentile (C) showed only negligible gains in the tests except in English and public affairs, in spite of the fact that the initial scores were very low. He was ranked at the 43d percentile in character. The most important factors in a disappointing college experience were lack of money and lack of physical vitality, together with low aptitude. He worked in a clerical capacity eight hours many days, and there was not enough energy left, even if there had been time, to do anything but minimum preparation for class. He was too busy earning to stay in college to grow intellectually. A sense of futility, the creation of his impossible situation, further-impaired his efficiency. He had no clear vocational interest. His participation in social activities was much too limited. Apparently he had no time at all for general reading. He was conscientious, but faced with too great a demand on his energy. In his employment experience since graduation he has been hindered by a feeling of inadequacy that, in part, is the result of the lack of achievement in college.

Student No. 10 (Fig. 27), scored at the 24th percentile in both scholastic aptitude, and average grade points, sustained actual loss in three testing areas, and made very small gains in the others. She was helped generously by parents. She did some work to help herself financially. She took little part in extra-curricular activities. She had no vocational goal. She revealed no intellectual or other interests. She went through the motions of studying, seemed to enjoy herself in a quiet way, but revealed no initiative. She was ranked at the 12th percentile in character. She is employed in routine clerical work.

Student No. 15 (Fig. 30), by contrast, ranked only a little higher in aptitude, percentile 36, and made only a C- grade point average (7th percentile), but she reveals striking and consistent gains in all four areas tested. Stable emotionally, provided for financially from home, she made a large circle of worthwhile friends. She had no vocational goal, but after an uncertain start she seemed to try to make the most of her

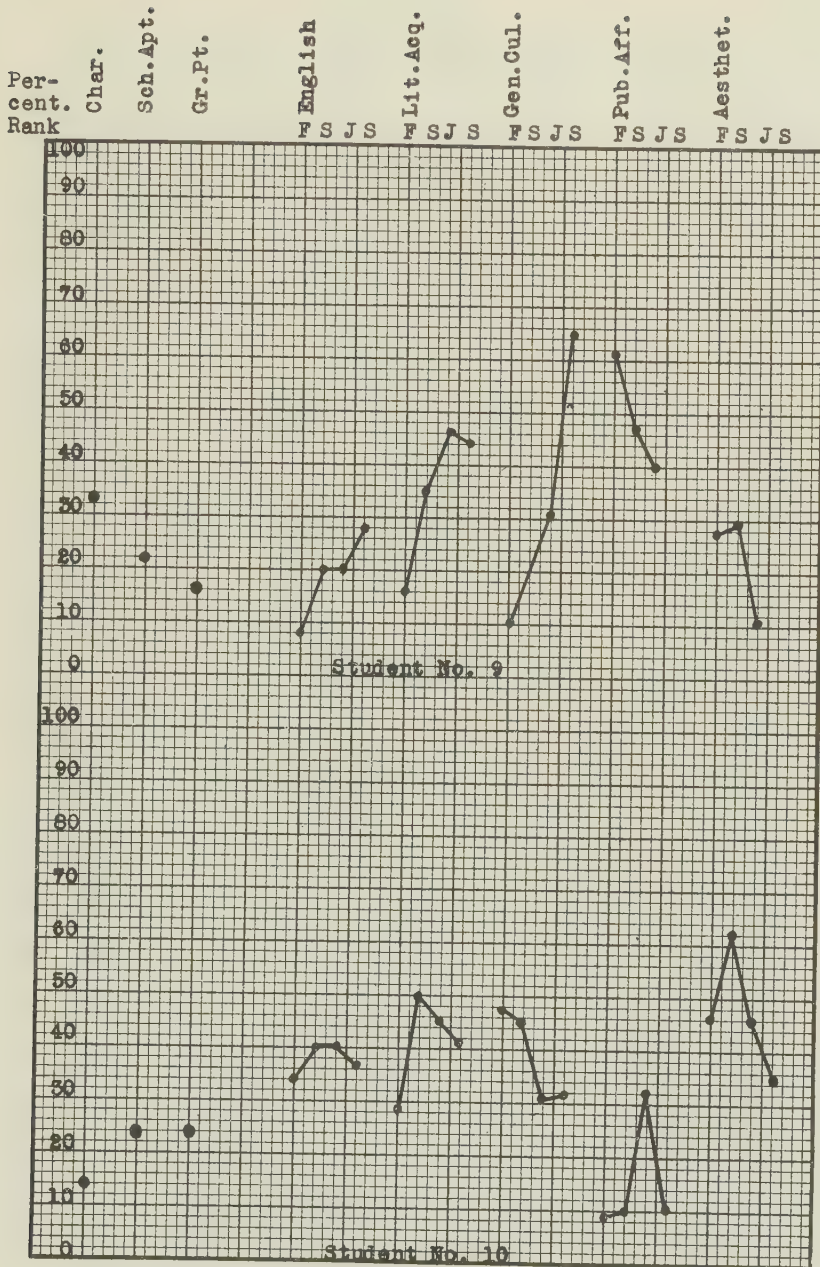


Fig. 27.--Profile charts of individual students

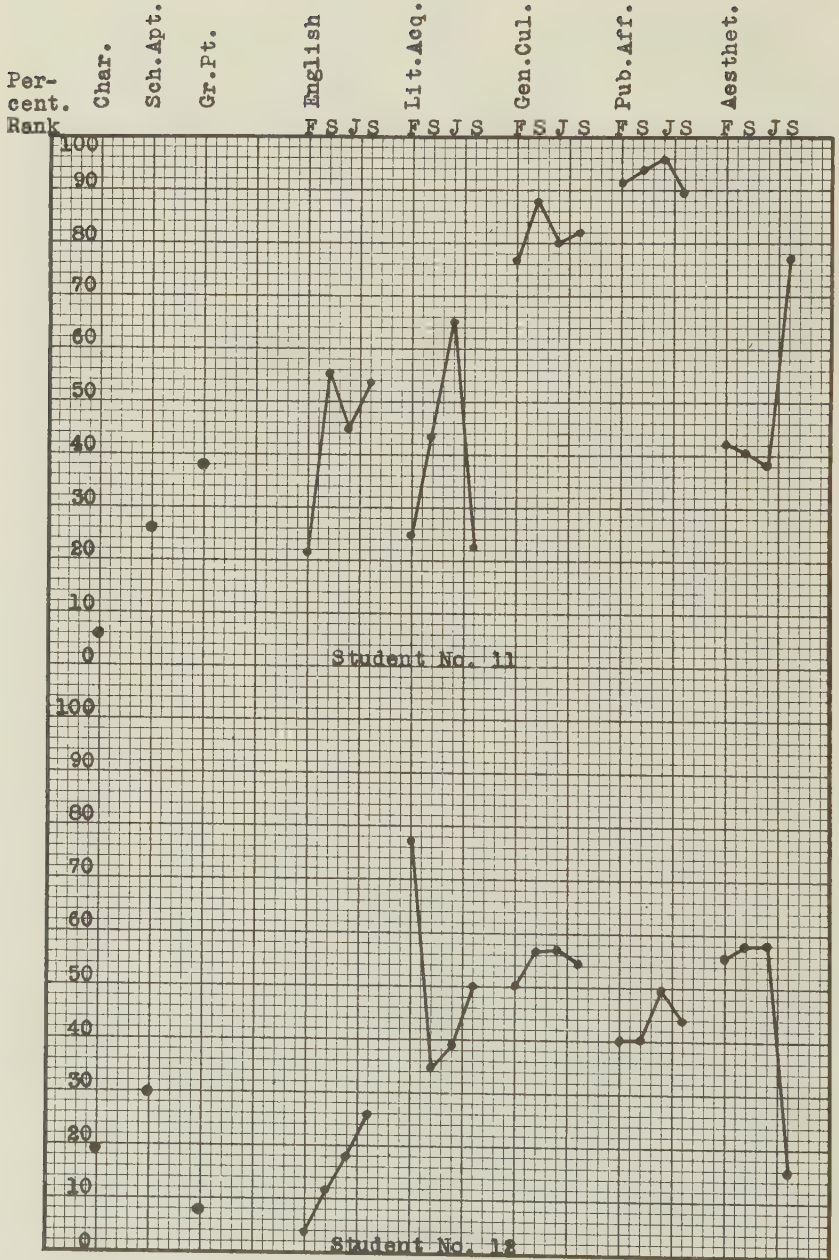


Fig. 28.--Profile charts of individual students

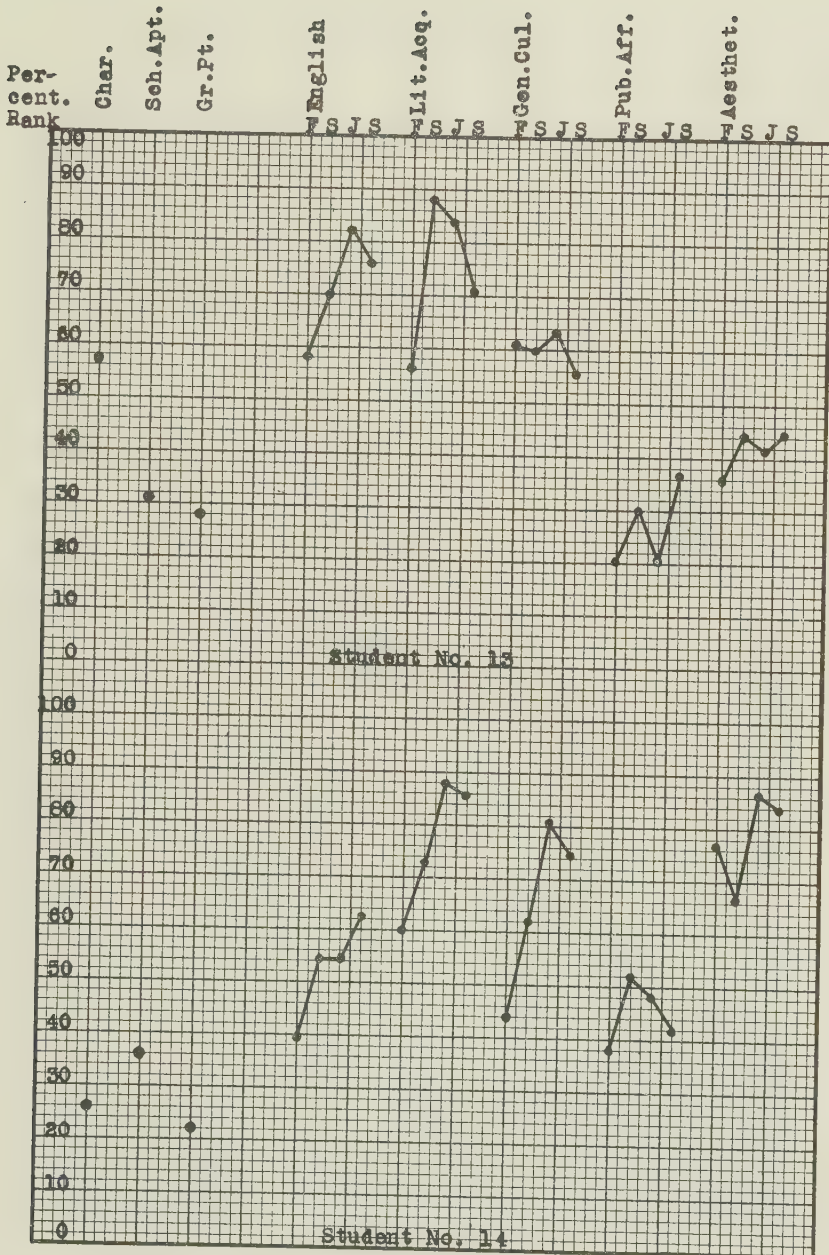


Fig. 29.--Profile charts of individual students

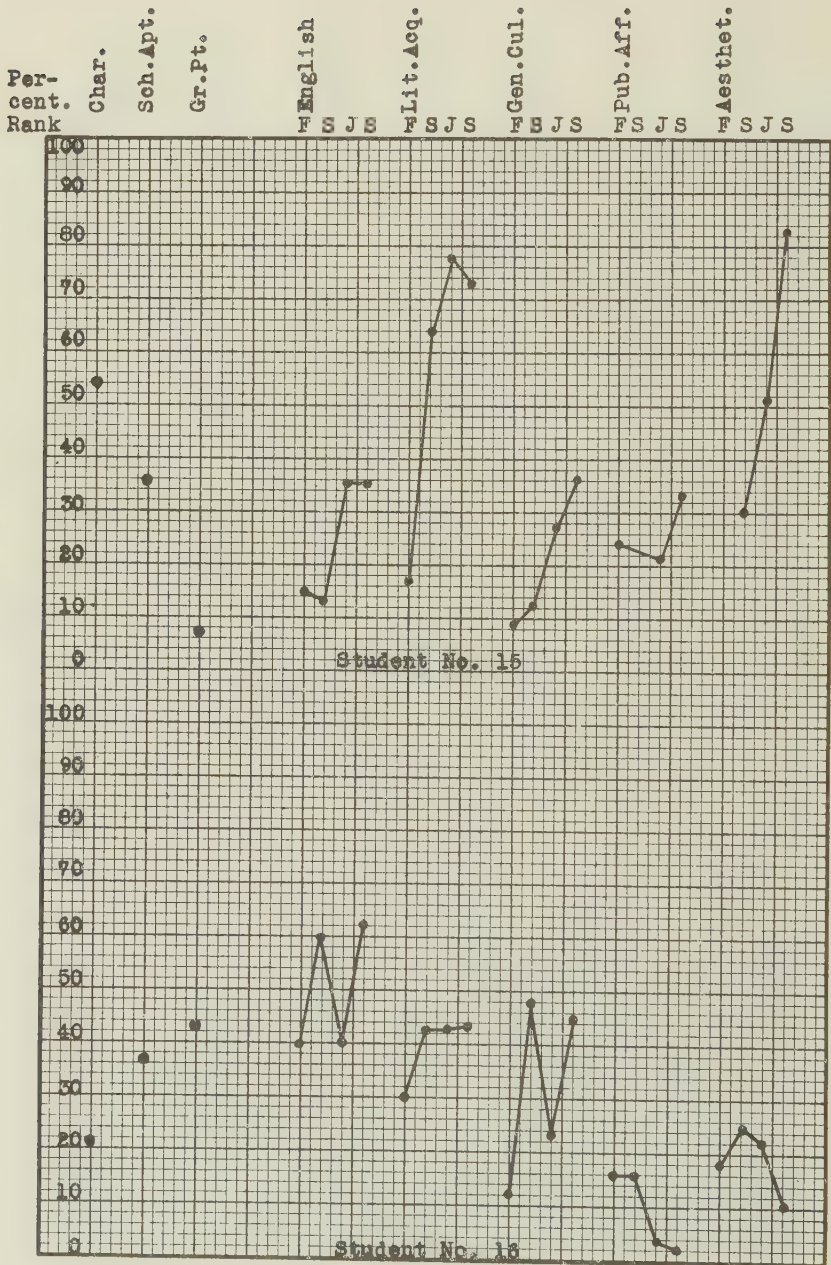


Fig. 30.--Profile charts of individual students

opportunities. Her Senior year average was slightly higher than B. She was ranked at the 54th percentile in character. She is now successful in business and active in worthwhile community and religious activities.

Student No. 17 (Fig. 31) is typical of the pleasant student who goes through the liberal arts college as a pre-requisite for something else, but without much interest in college work. In scholastic aptitude at the 37th percentile in grade point average, he ranked at only the 3d percentile. He sustained an actual loss in two testing areas and made only fair gains from a very low initial score in the others. He was a friendly athlete who did enough studying to keep eligible. With no financial worries, his college experience was pleasant and not too taxing. He was ranked at the 16th percentile in character.

In sharp contrast is student No. 18 who came to college after several years of farming. With no clear vocational goal, he was determined to grow as much as he could. Although at only the 39th percentile in scholastic aptitude and with some low initial scores, he ranked in his Senior year at the 58th, 83d, 92d, and 53d national percentiles in the five test areas. His grade point average was at the 89th percentile (B). He paid his college expenses out of his earnings and from previous savings. His physical vitality was unusually high. He entered heartily into extra-curricular activity and found time to broaden his interests in music, art and literature outside of the campus. His maturity and capacity for self-direction made his college experience rewarding. It is not surprising that he was ranked at the 95th percentile in character. He is doing graduate work.

Student No. 20 (Fig. 32), at the 42d percentile in scholastic aptitude, reached the 93d, 91st, 71st, 55th, and 65th percentiles in achievement tests in her Senior year. The grade point average was at the 68th percentile (B-). In the Senior year, she was just under A-. This student came to college on her own responsibility after four years of intermittent employment following high school. While in college, she earned her expenses through responsible clerical work. Emotionally well adjusted, with vocational goal well defined and with good health, she was able to work thirty to forty hours a week, participate in extra-curricular activities, and yet make a superior scholastic record. She was ranked highest of the 85 students in character. She is

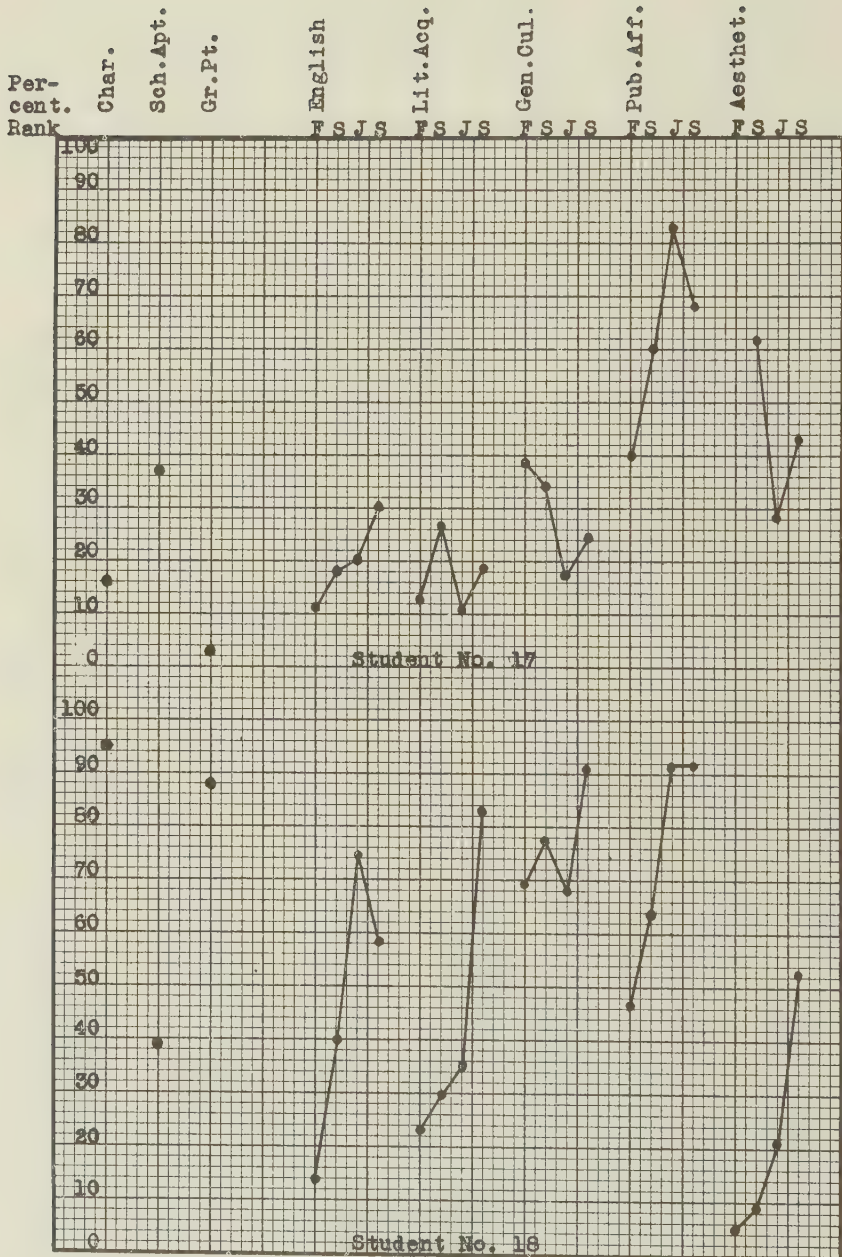


Fig. 31.--Profile charts of individual students

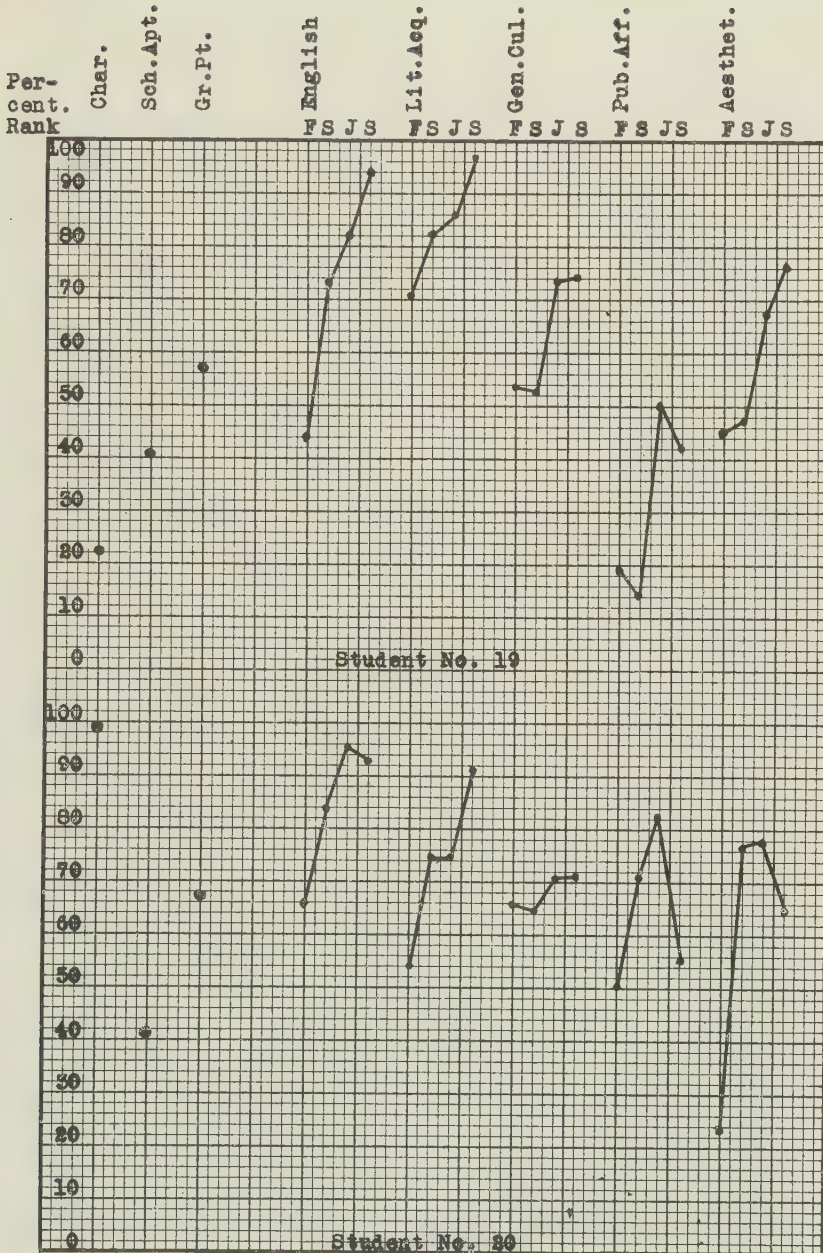


Fig. 32.--Profile charts of individual students

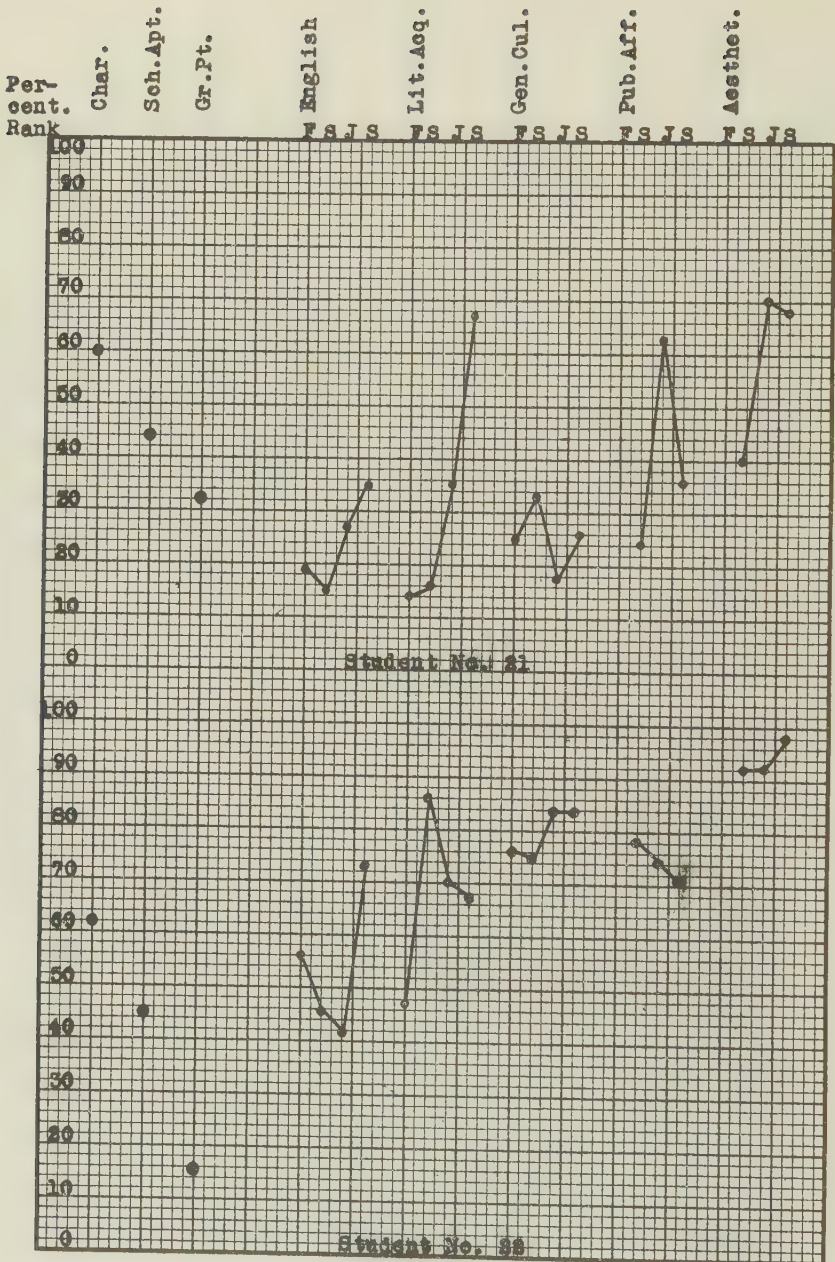


Fig. 33.--Profile charts of individual students

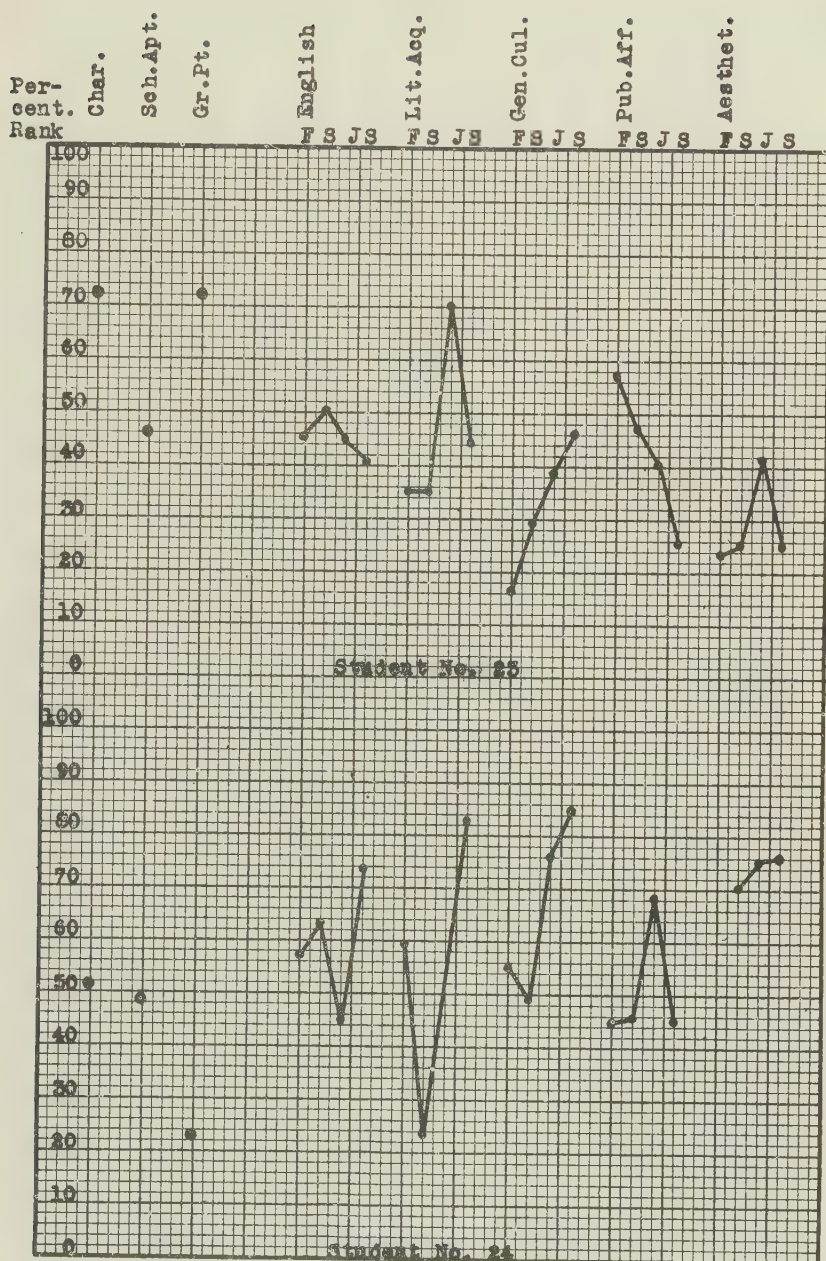


Fig. 34.--Profile charts of individual students

employed in a responsible minor executive capacity, is studying to make possible further advancement, and is active in community and religious service.

Student No. 26 (Fig. 35) ranked at the 51st percentile in scholastic aptitude and scored at the 95th, 84th, 79th, 62d, and 43d percentiles in the achievement tests in her Senior year, although she specialized rather narrowly in biology. Her vocational choice was definite. She was emotionally well adjusted. Her grade point average ranked at the 99th percentile (A-). She, too, worked long hours to earn her expenses. However, she found time and energy for extra-curricular activities. She was ranked at the 93d percentile in character. She is now a successful high school teacher.

Student No. 27 (Fig. 36), an orphan, entered college with no financial resources after some years of domestic service, determined to equip herself as a teacher. With a scholastic aptitude percentile of 52 and a grade point average at the 65th percentile (B-), she showed striking gains in the tests, in some cases from low initial scores. She was prevented by employment obligations from extended social activities, yet her college experience was one of continually expanding horizons. Despite certain emotional handicaps and personality deficiencies which contributed to a ranking at the 19th percentile in character, she is making a reasonable success as an elementary teacher.

Student No. 32 (Fig. 38) illustrates what may happen to the college experience of a fine person for the lack of money. Dependent upon her own earnings and a trusted employee during college days, she had little time for current periodical reading and social activities. As one result, her percentile rank on the sections of the contemporary affairs test dropped from 78 and 25 in the Freshman year to 52 and 10 respectively in the Senior year. Her English and Literary Acquaintance scores decline steadily after the Sophomore year. She ranked at the 62d percentile in scholastic aptitude and at the 90th percentile in character. The grade point average ranked at the 92d (B). She was known as a faithful student in course work. A little more money from home so that there could have been more free hours would have paid high dividends.

Student No. 35 (Fig. 40) ranked at the 70th percentile in aptitude, made very large gains in three of the four areas

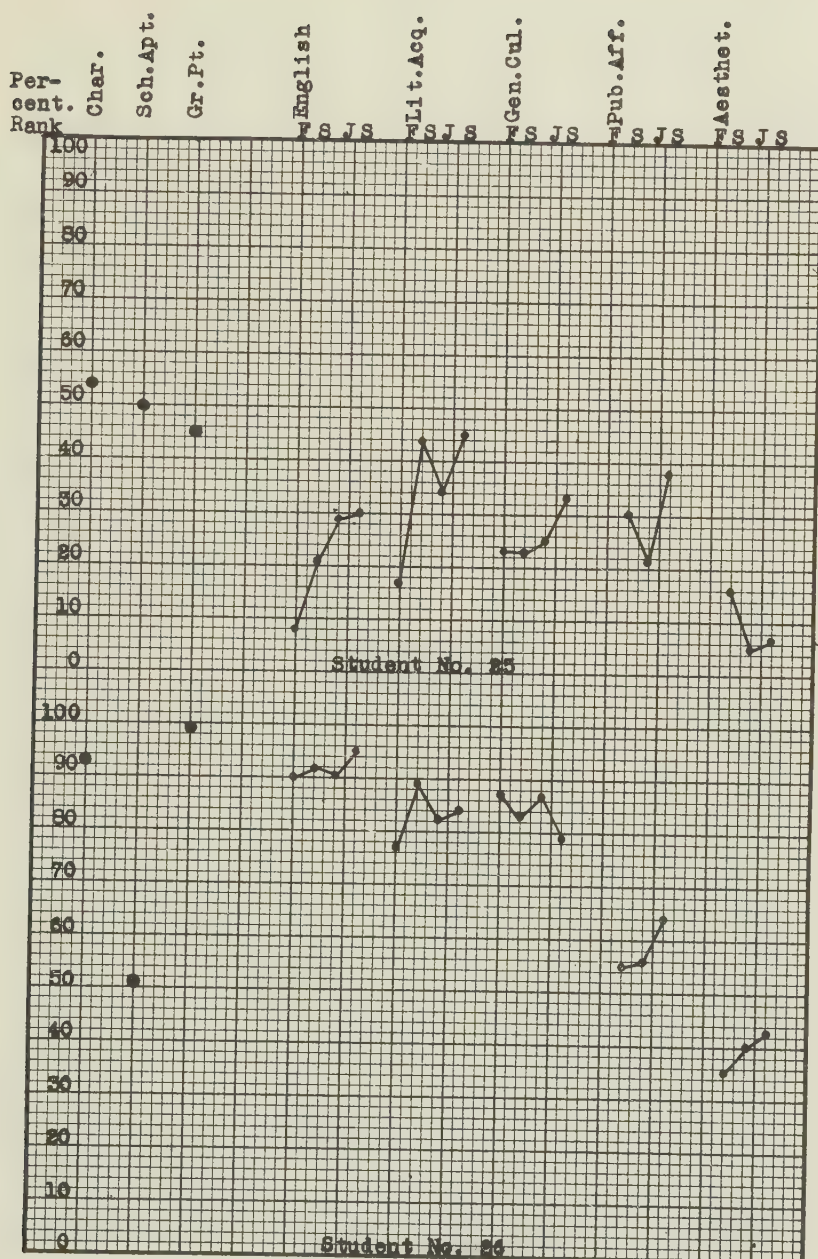


Fig. 35.--Profile charts of individual students

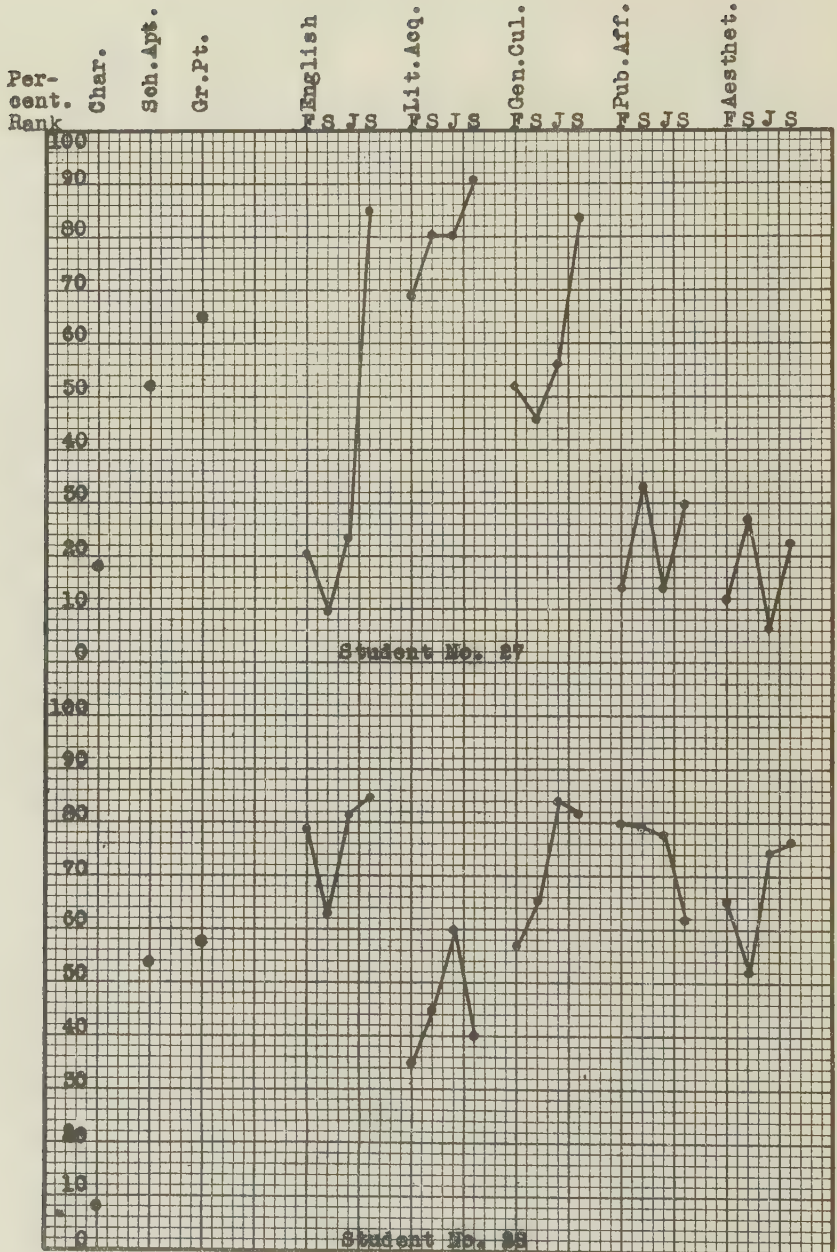


Fig. 36.--Profile charts of individual students

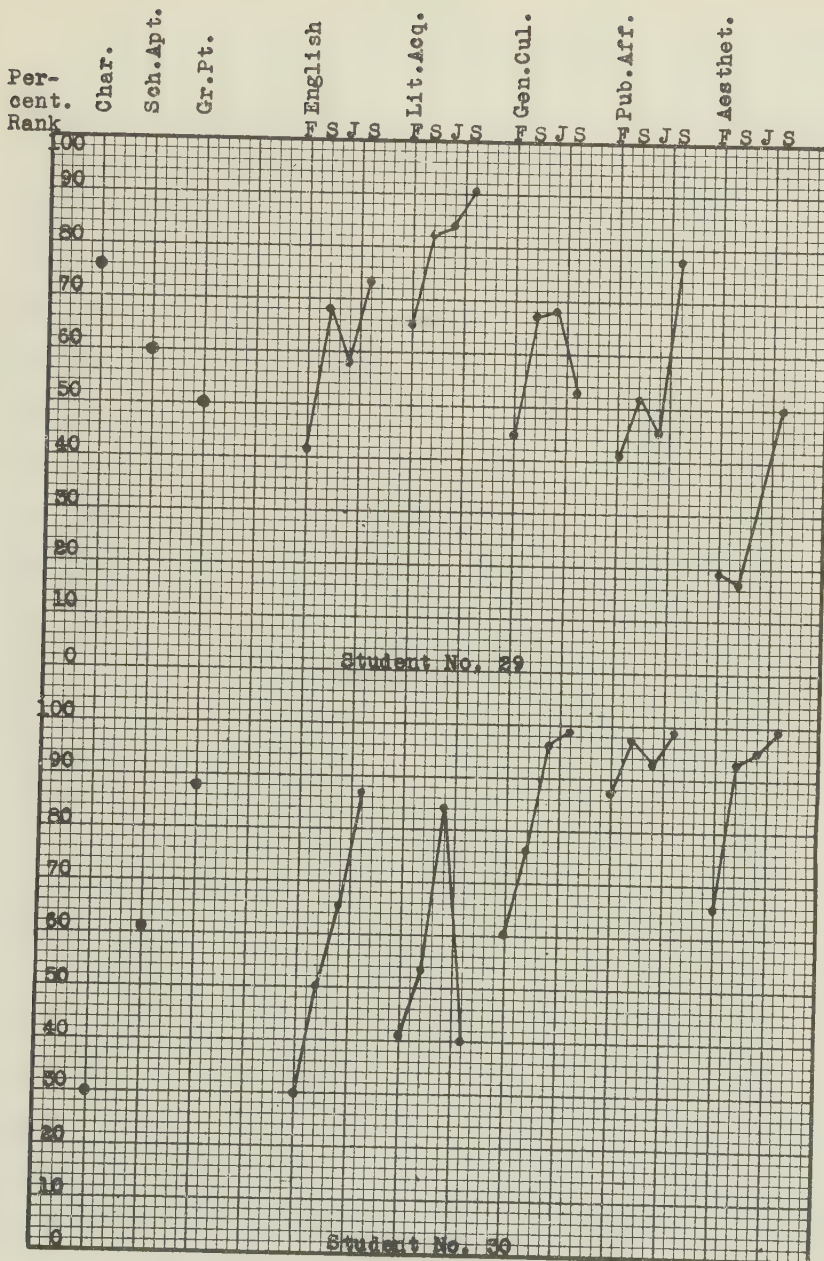


Fig. 37.--Profile charts of individual students

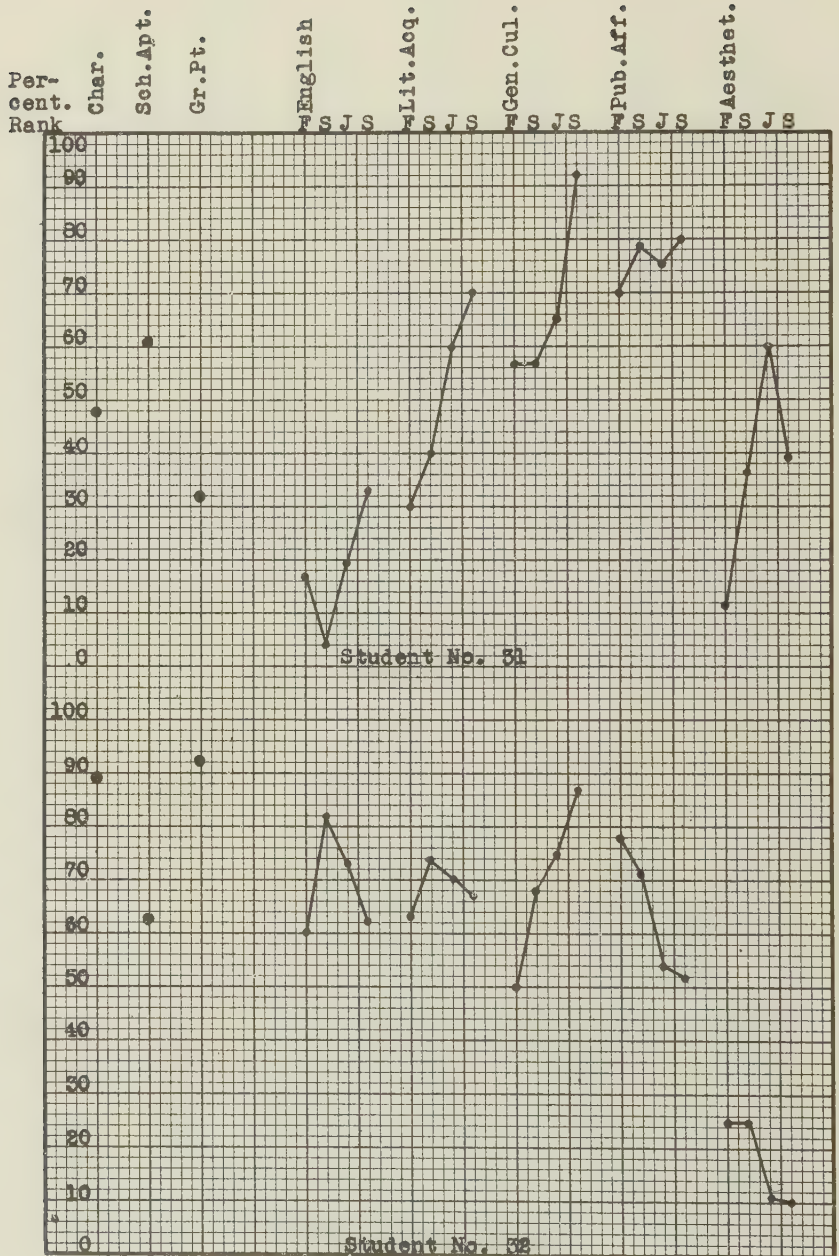


Fig. 38.--Profile charts of individual students

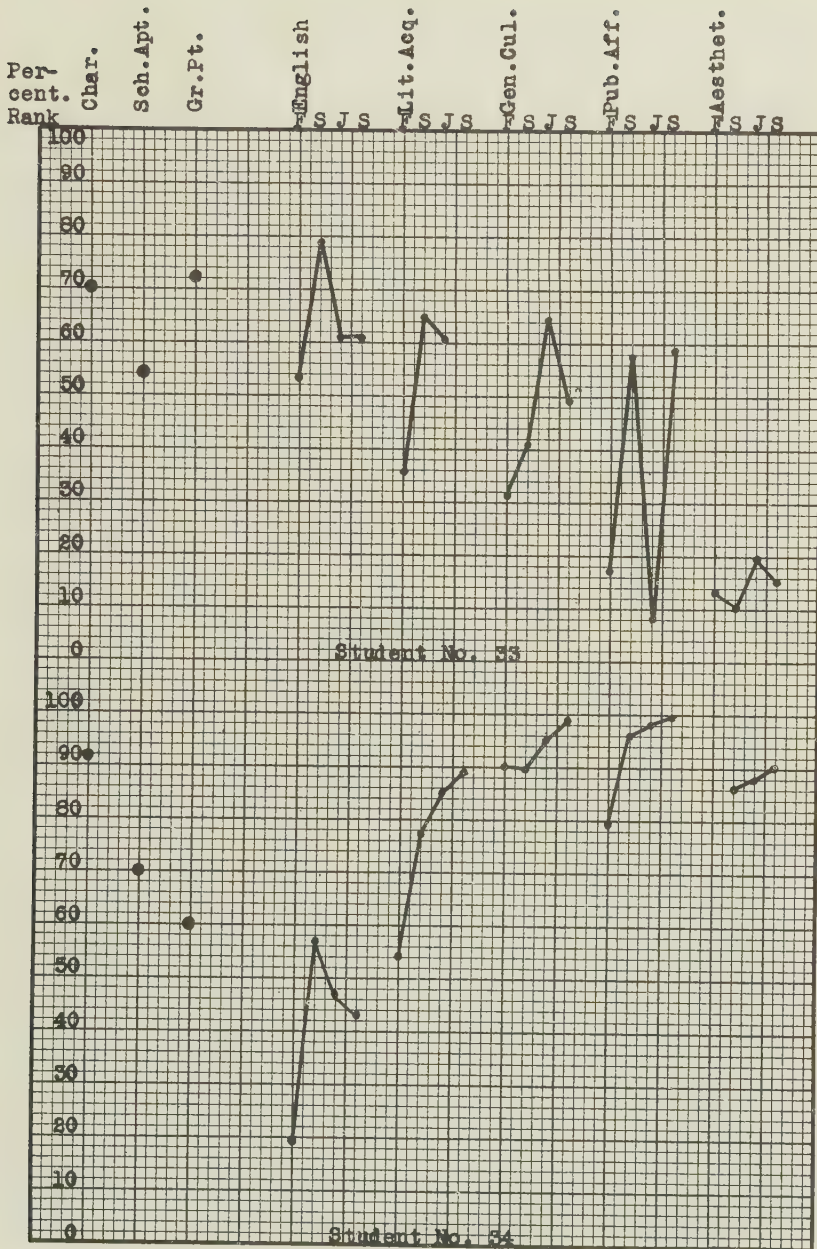


Fig. 39.---Profile charts of individual students

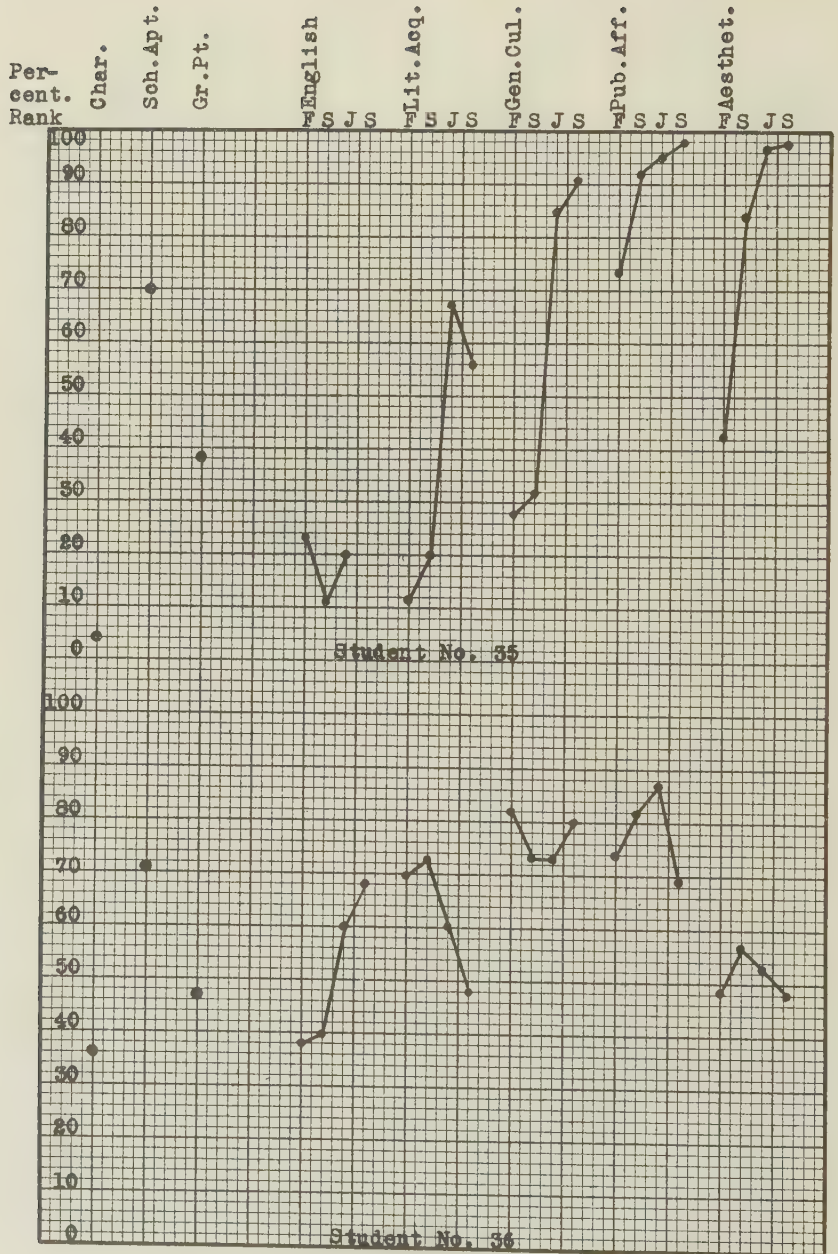


Fig. 40.--Profile charts of individual students

tested, yet made a grade point average at only the 38th percentile (C) and ranked at the 4th percentile in character. His college financial obligations were taken care of by his parents. In personal standards and appearance, he was a thorough individualist, and frequently found himself out of sympathy with the accepted ways of doing things whether in written work, in the classroom, or off the campus. A lack of vocational goal and inadequate emotional control contributed to an attitude of rebellion. His athletic participation suffered from the same lack of self-discipline. It did not appear when he was in college that the course of study being followed really met his need. Yet, that he was learning much in some areas is indicated by four out of five of the test scores. Since graduation, however, the difficulty of finding employment at first and later the responsibility of a job are helping him to find himself. It appears that his college experience will pay deferred dividends.

Student No. 36 (Fig. 40) is another example of a potentially able student who did not realize his full possibilities. He stands at the 71st percentile in scholastic aptitude and with good initial scores in the tests, but his Senior score is lower in three of the four tests than his Freshman score. In the expressed judgment of his teachers, the grade point average at the 47th percentile (B-) is no criterion of his possible performance. The necessity of assuming the responsibility for all his college expenses plus emotional difficulties that antedated college and were the result of an unsatisfactory home situation made his performance unpredictable. The vocational goal was vague. There was too little self-discipline. The character ranking was 33. This graduate is now employed but shows little sense of responsibility in meeting obligations incurred in college. It is a question whether the college experience strengthened or weakened this student.

Student No. 40 (Fig. 42) with a scholastic aptitude ranking of 75, made Senior test scores at the 30th, 20th, 40th, and 9th percentiles. The grade point average was at the 12th percentile (C-). The character rank was 1. This was an emotionally unstable student whose home background had been psychologically unfortunate. There was little real extra-curricular life because the student was socially unacceptable. Some work was necessary to help with expenses, although most of the money came from home.

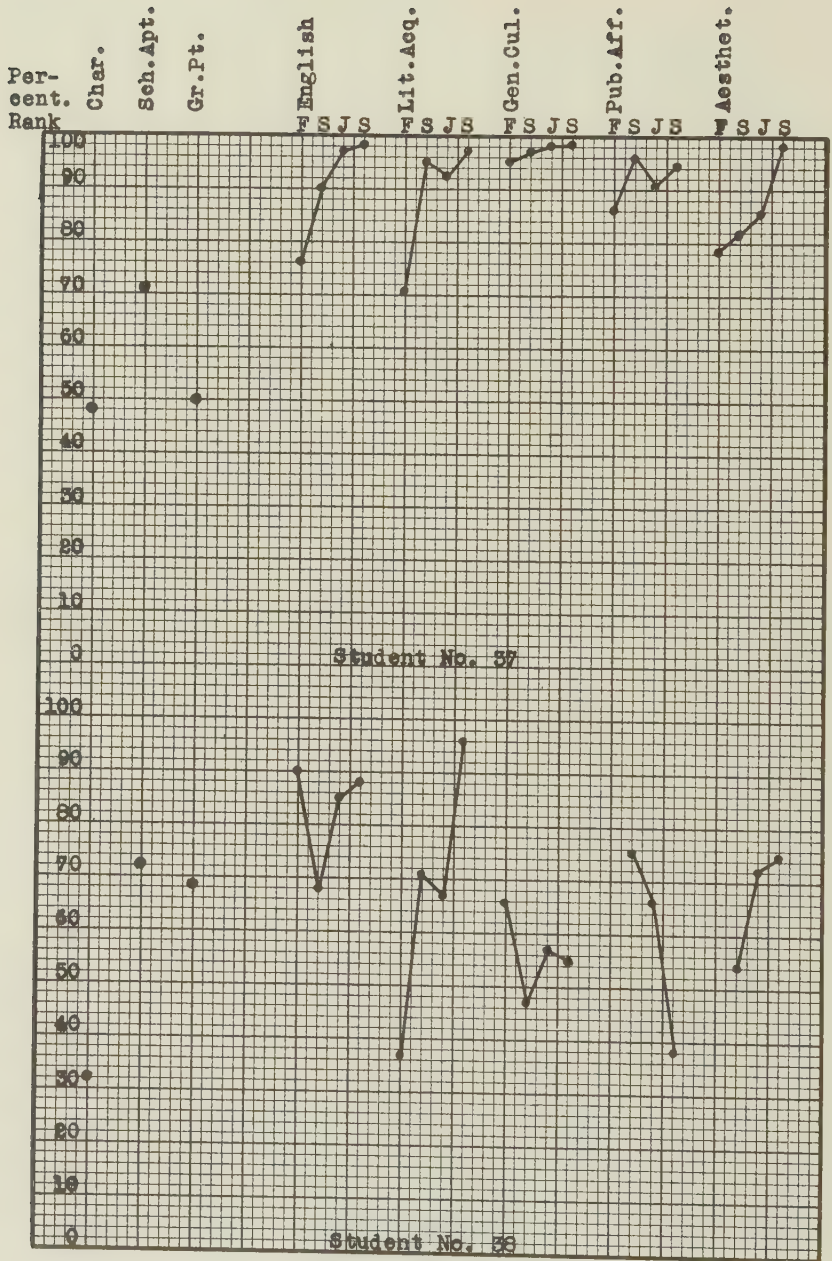


Fig. 41.--Profile charts of individual students

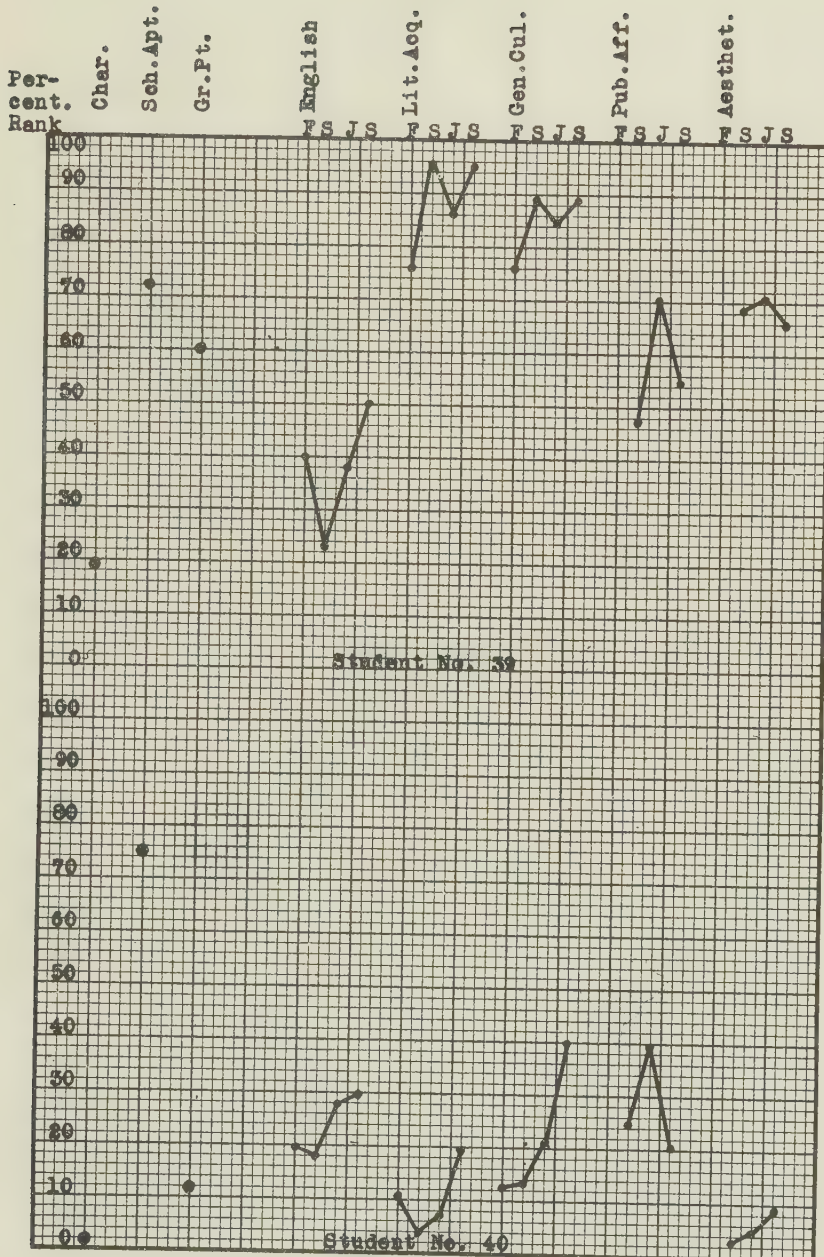


Fig. 42.--Profile charts of individual students

The problem here was primarily emotional, and with professional psychiatric help, the student was enabled to finish college. Whether that was a service or not is doubtful.

Student No. 41 (Fig. 43) presents a striking contrast between test scores and grade point average. In the tests, she made net gains in all areas despite the fact that her initial scores are high. As a Senior, her tests ranked at the 91st, 95th, 73d, 52d, and 93d percentiles. Yet her grade point average was only at the 8th percentile (C-). Her scholastic aptitude rank was 75. Her personal habits, attitudes, and associations were not acceptable to her instructors, and that fact may have been reflected in course grades. More serious factors were a lack of emotional balance, poor work habits, and an excessive individualism that made her performance spotty. Her expenses were met by her parents. She had a definite vocational choice, teaching. Her character rank was 3. She is teaching successfully and is finding herself in the experience.

Student No. 47 (Fig. 46), scholastic aptitude rank 85, shows a high initial score in the tests, with one exception, and consistent gains in all test scores. His grade point average is at the 72d percentile (B-). He is an example of a student who organized his college life around the theory that classes were not of greatest importance. A wide reader, a lover of beauty, a desirable member of a social group, he took time in college to do the things important to him. A responsible leader in extra-curricular activities, he made significant contributions to student life. He was too busy doing things important to him to be concerned about an A in a course. Yet to him, college brought a rich educational experience. He was ranked at the 97th percentile in character. He has since made a distinguished record in graduate work and is serving actively in religious fields.

Student No. 51 (Fig. 48) is an example of a person who belongs near the top because of intellectual endowment and has the courage and self-discipline to climb to the top. The scores are consistently the highest in the group, and yet the scholastic aptitude percentile is just 88. The percentile ranks obscure the fact that in some of the tests there were very large gains in raw score from year to year. For example, the equated raw scores in the General Culture Test were 229, 286, 302, and 362 for the four testings from the Freshman to the Senior year. The grade

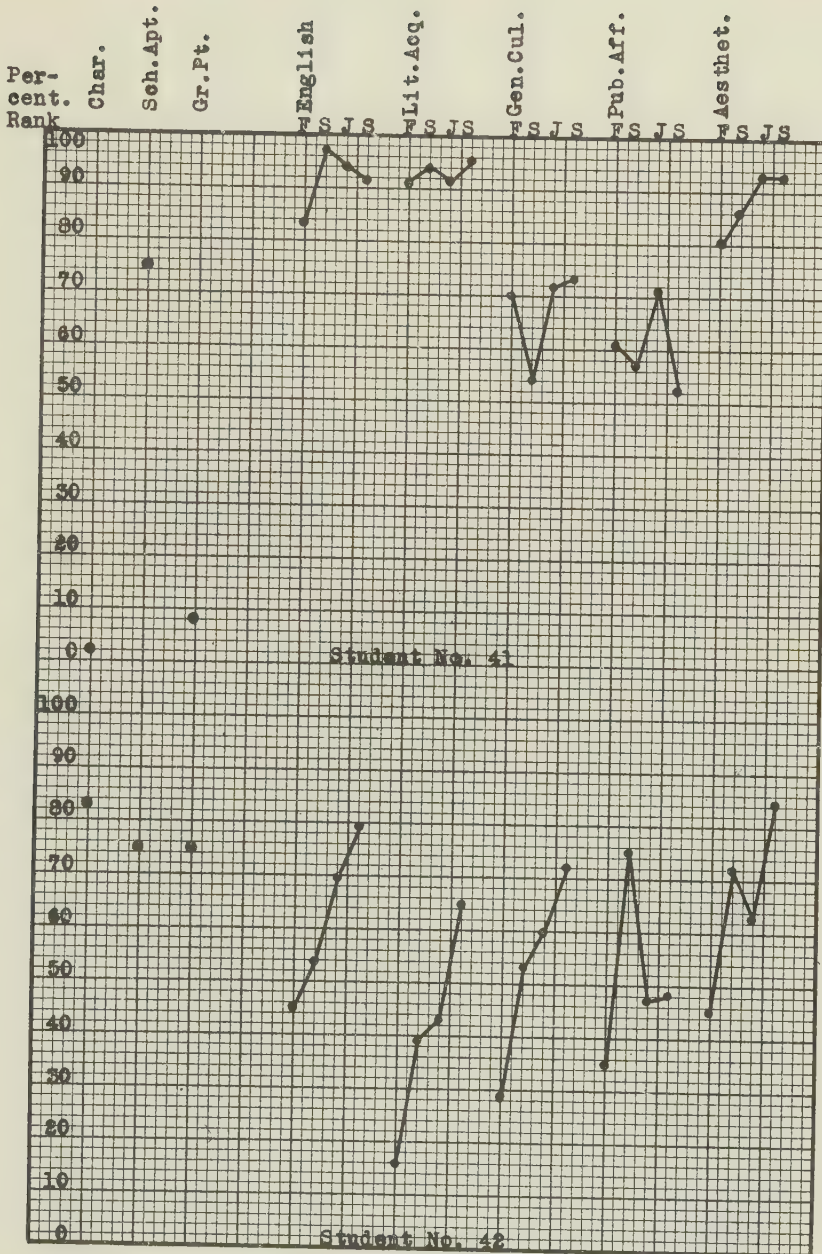


Fig. 43.--Profile charts of individual students

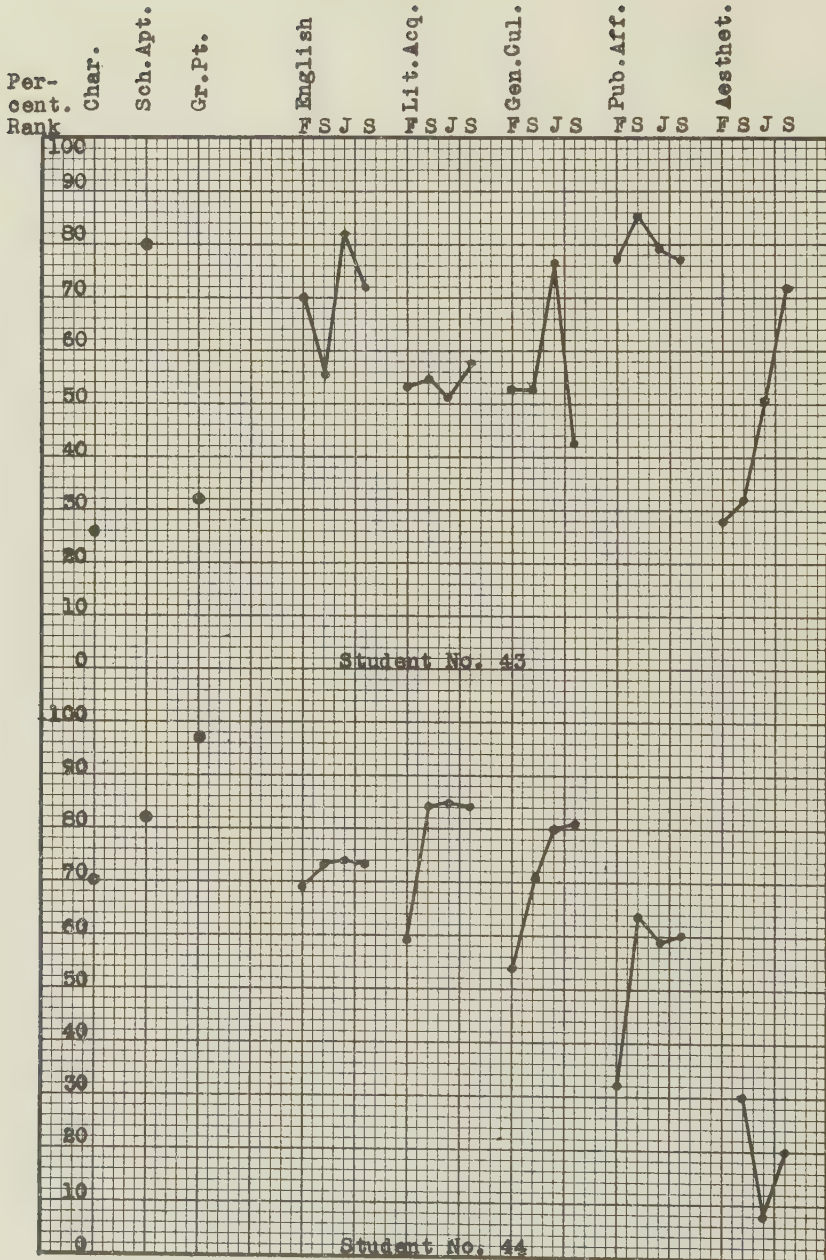


Fig. 44.--Profile charts of individual students

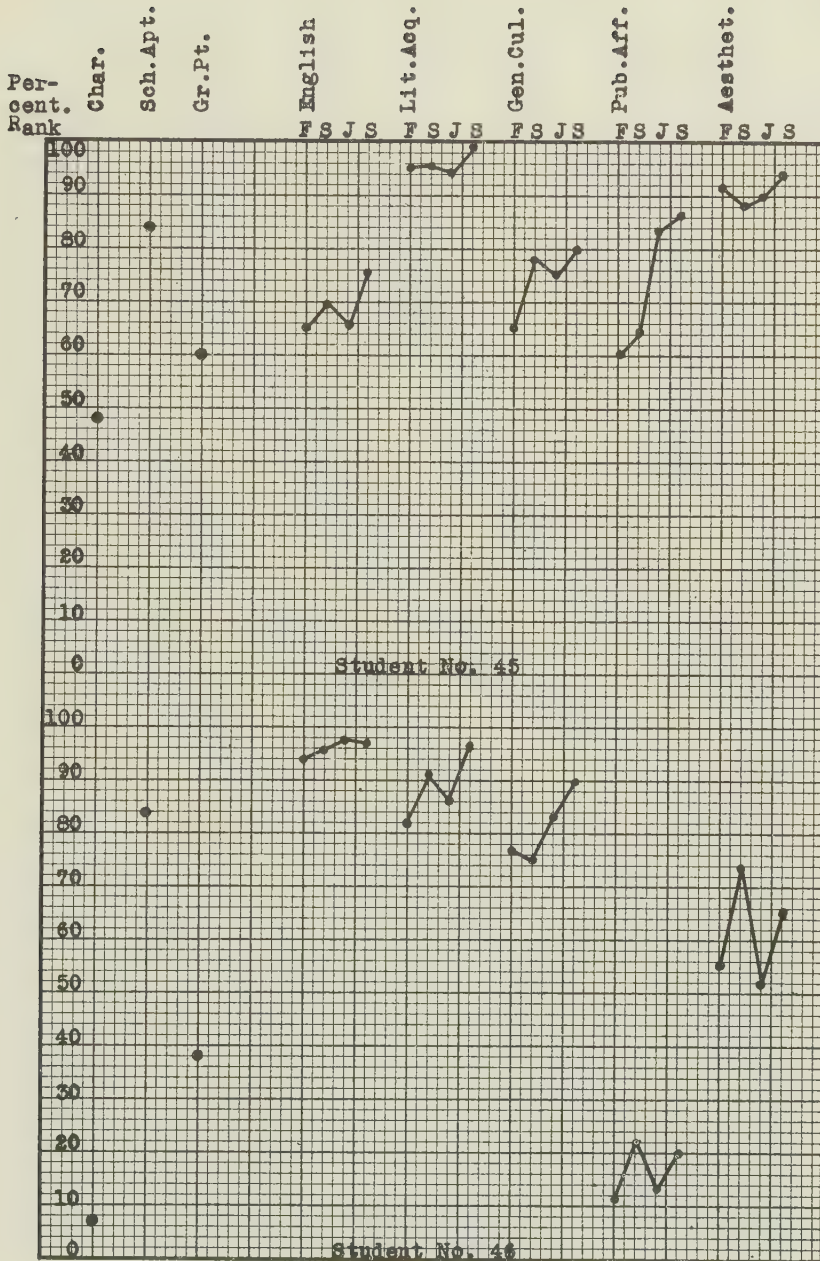


Fig. 45.--Profile charts of individual students

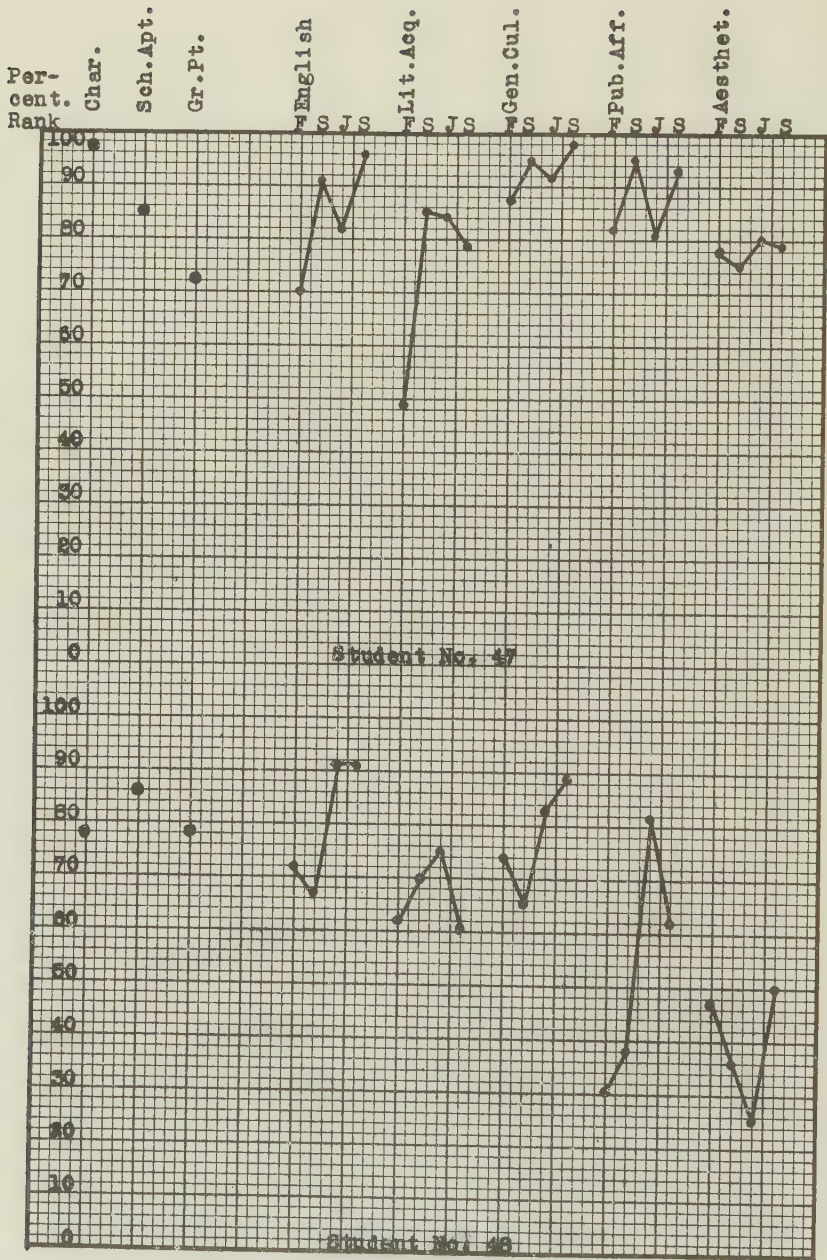


Fig. 46.--Profile charts of individual students

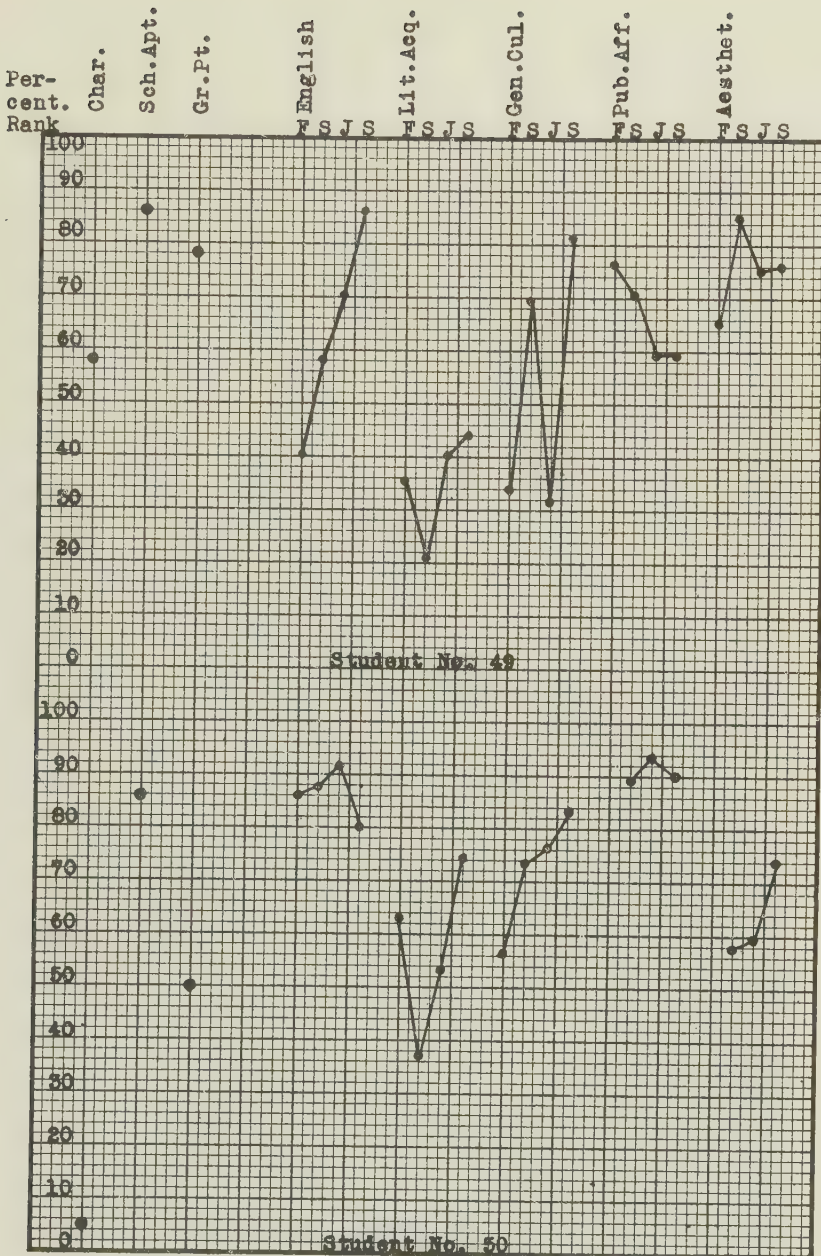


Fig. 47.--Profile charts of individual students

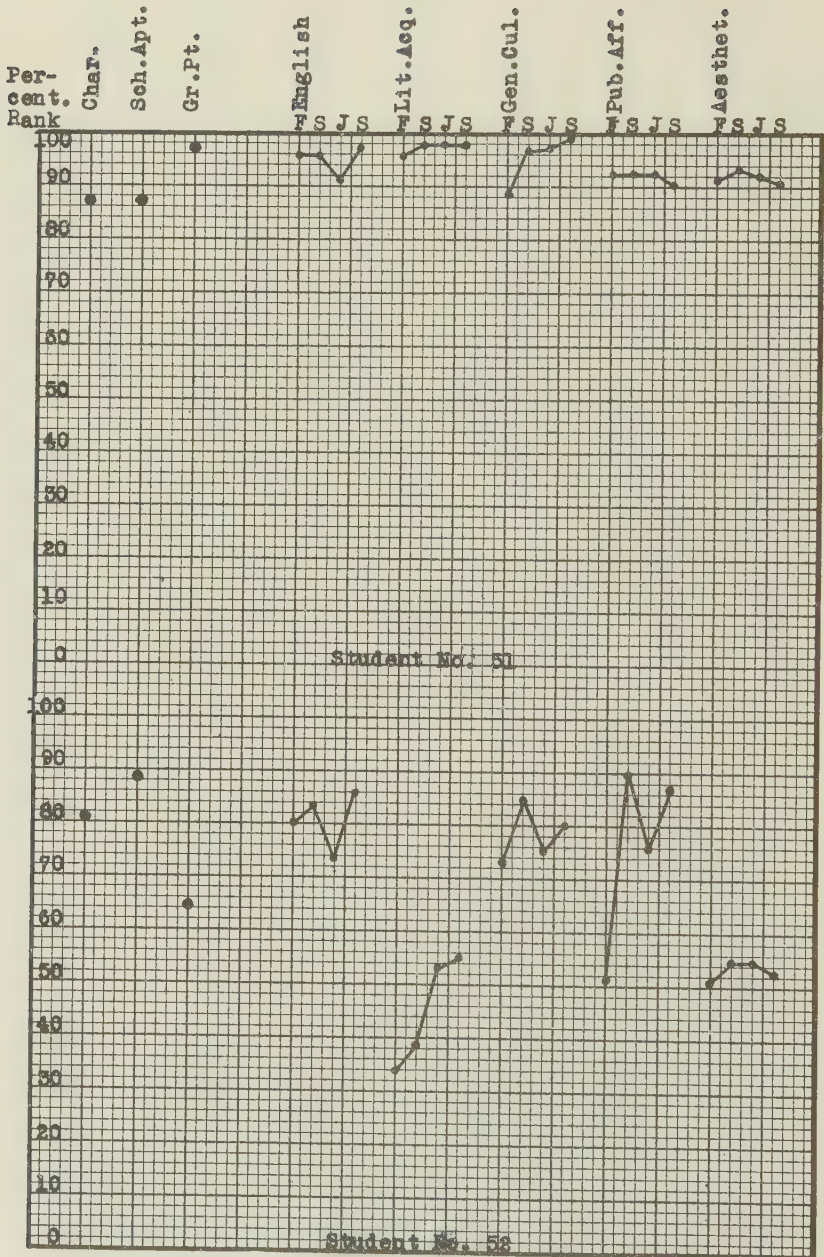


Fig. 48.--Profile charts of individual students

point average ranks at the 97th percentile (A-). In character, she was ranked at the 87th percentile. With expenses paid from home, this student was free to devote time both to study and to college activities. The vocational choice was clear, teaching. She is now a successful teacher.

Student No. 54 (Fig. 49) had a slightly higher scholastic aptitude percentile, 89, but his test performances were disappointing. His grade point average, too, was only at the 27th percentile (C). He came to college very young from a home of rigid restraint, and he never learned to use the freedom of the campus. Endowed with a mind that enabled him to keep pace with less favored classmates, he got by without doing any real work. The incompleteness of his test record as shown on the chart is a result of his irresponsibility. Potentially a leader of his fellows, he played away that opportunity, too. With no clear vocational goal and with no settled philosophy of life, he missed much in his college years. He was ranked at the 6th percentile in character. His business experience since college has included several changes.

Student No. 56 (Fig. 50), on the other hand, with about the same scholastic aptitude score, has made better use of his gifts. Three of his Senior test scores rank at the 96th percentile or above. His grade point average is 6.9 (B). The scholastic aptitude rank is 91, and he was ranked at the 89th percentile in character. He participated extensively in extra-curricular activities. His vocational goal was definite from the beginning, teaching. He has made an excellent record in graduate study.

In connection with the records of Student No. 58 (Fig. 51) and Student No. 60 (Fig. 52), again the percentile ranks of 98 and 99 do not reveal the large and consistent gains in raw score made by these students.

Summary

The records of individual college students have been discussed in this chapter in order to make it clear that there are other factors than scholastic aptitude and curriculum that determine achievement in college. The truth seems to be that there are so many different factors, any one of which, or any grouping of which, may determine the result, that it is impossible to be

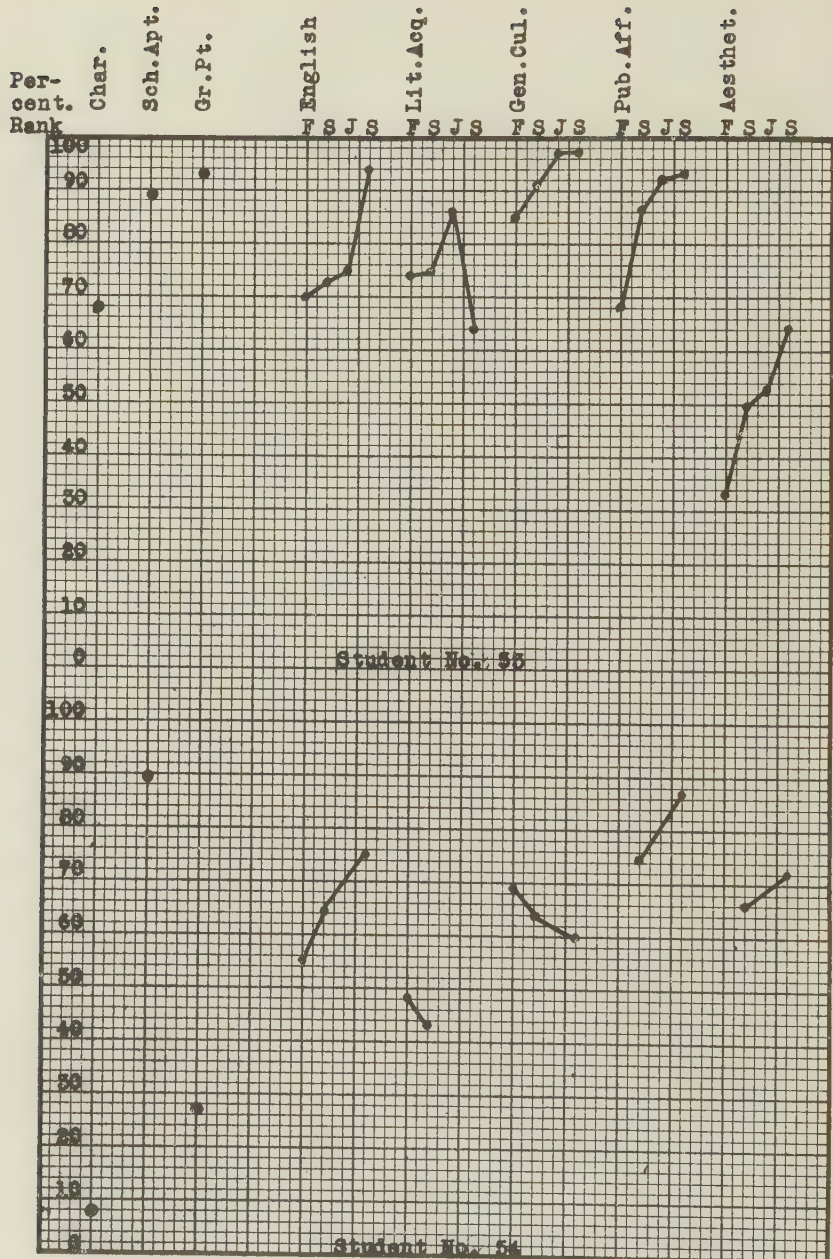


Fig. 49.--Profile charts of individual students

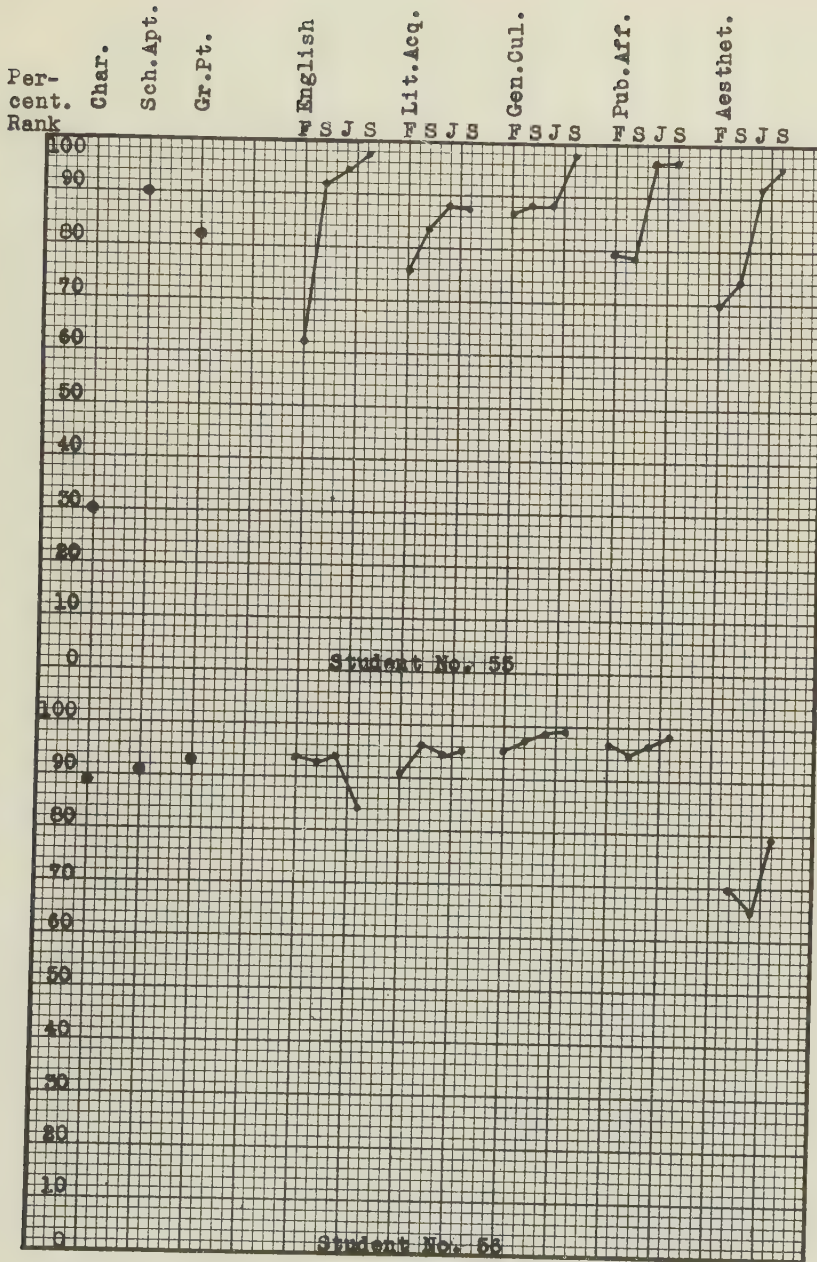


Fig. 50.--Profile charts of individual students

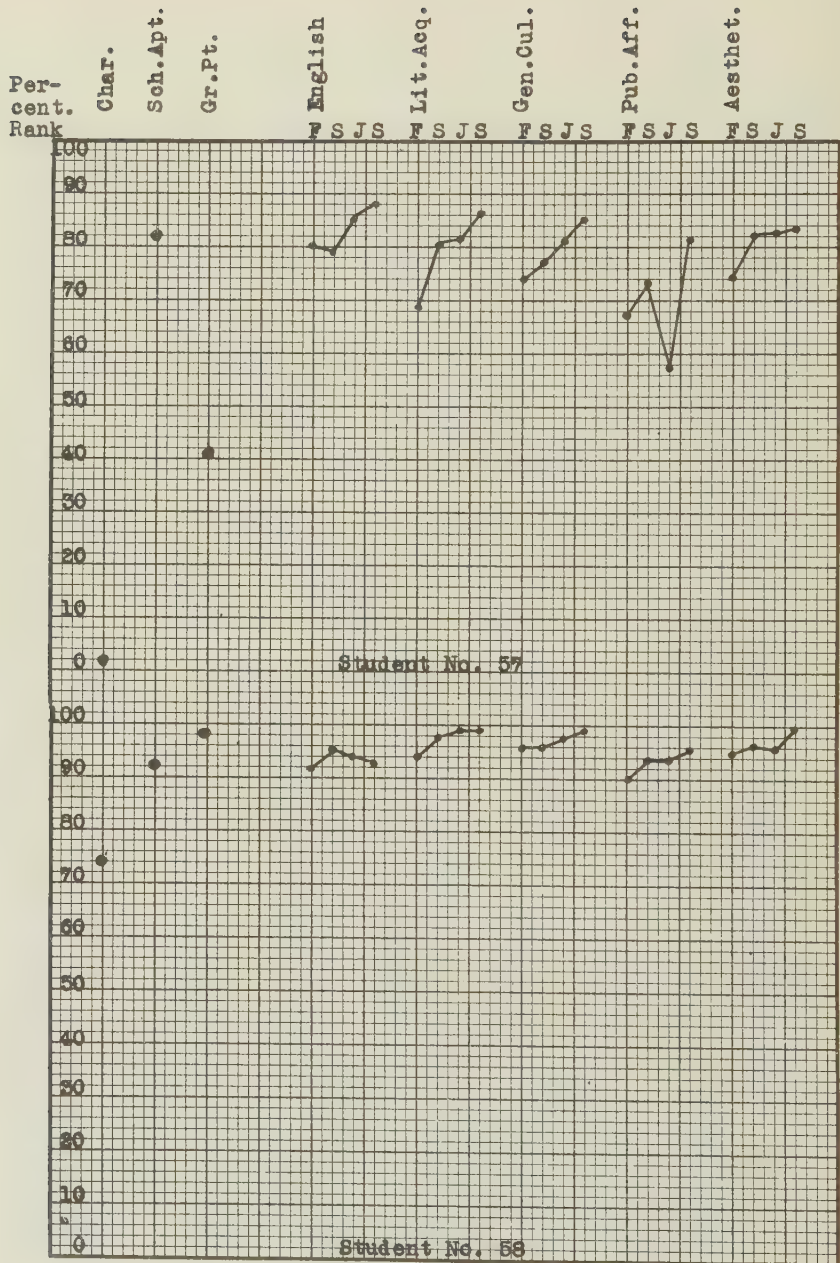


Fig. 51.--Profile charts of individual students

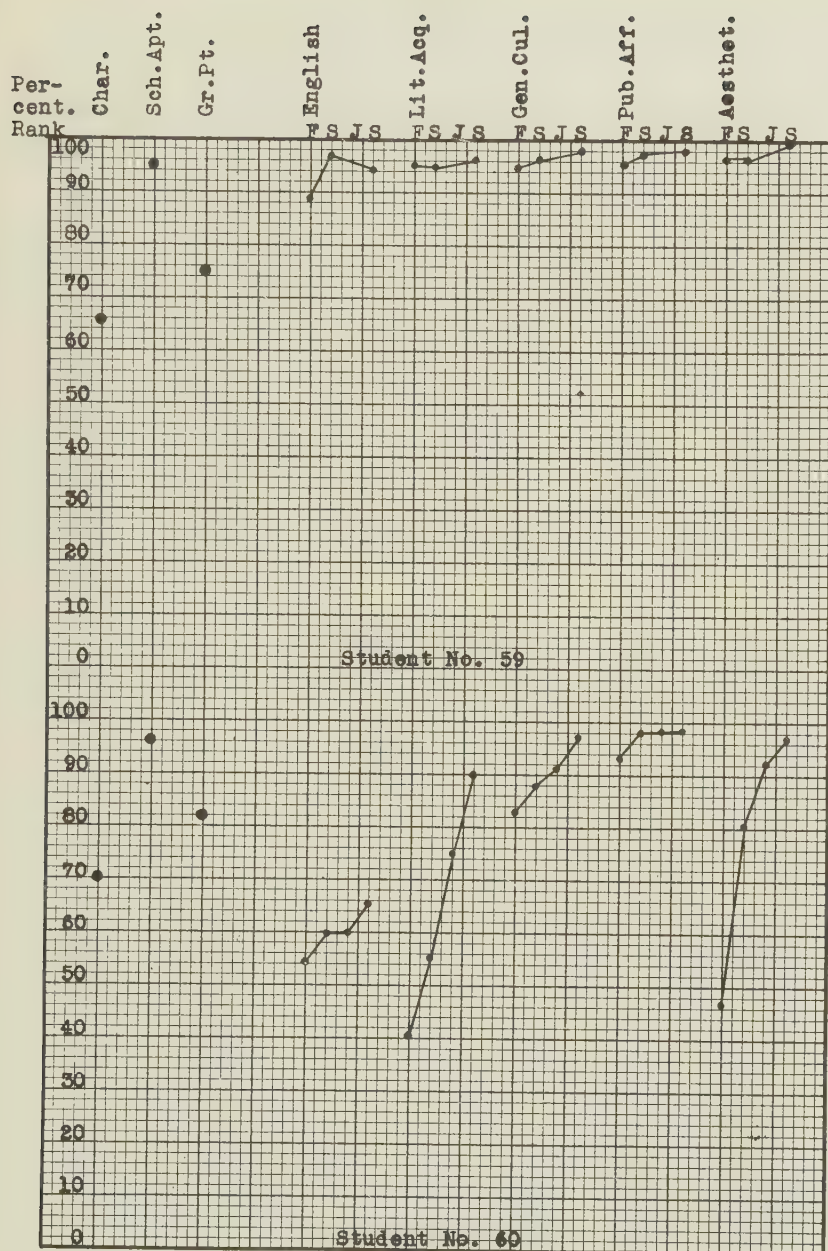


Fig. 52.--Profile charts of individual students

dogmatic and insist that it is this more than that. That scholastic aptitude is important is recognized. There seem to be limitations to the possible intellectual achievements of a ten percentile mind. But there are so many other factors that might work in compensating fashion that it is not enough for individual guidance to know just that score.

In the absence of objective measurements for many of these factors, any pronouncements must lie in varying degree in the realm of opinion. However, the present investigator ventures to make certain suggestions concerning the less tangible factors that influence college achievement.

A review of the individual cases just presented shows that important among the positive factors are: definite vocational goal, sense of personal responsibility that often is associated with earning a considerable part of one's college expenses, good health, a Christian conviction or philosophy of life that tends to integrate the personality, and experience in self-direction.

On the negative side would be listed: home backgrounds in which young people are controlled by prohibition rather than by teaching them discrimination, emotional instability, absence of vocational goal, too great a burden of self-support, a course of study that does not challenge because it does not meet the student's interests, and moral weakness.

The description of a dozen more cases would have brought to light other conditions: extreme poverty, the boy madly in love, the student worried about illness at home, the student plagued by a sense of social inadequacy, the student with engineering interests who cannot get an engineering course, etc.

These different items may have different weights for each person. Actual observation indicates, for example, that a man at even the 5th scholastic aptitude percentile who must earn all his way in college may succeed if he has unusually vigorous health and strong purpose. To a man at the 70th percentile whose expenses are paid by father, the same vigorous health is not as essential if he is to complete college. Or perhaps the hours taken by a campus love affair will not be missed by the student who ranks with the top ten in scholastic aptitude while it will completely wreck the man who must study long hours every night if he is to maintain even an average pace of scholastic achievement.

The suggestions for personnel work implicit in the last few paragraphs are already accepted generally in theory if not in practice. It is important for the college counselling officers to know the psychological score, the reading rate, the test records, and the high school marks. They should also know what can be learned through emotional inventories, time records, and physicians' reports. But, in addition to all the information that can be gleaned through such instruments and even through anecdotal records, the personal interview in the hands of a skillful and sympathetic educator will be an indispensable tool. If each student is to a degree unique, and if each separate set of circumstances presents a different pattern, then individual diagnosis and treatment is necessary. Otherwise, the most significant factor in a particular student's situation may be missed entirely. The emphasis of this chapter is that if personnel procedure is to be most helpful to the student, it must deal with him as an individual. The real person can be lost too easily in averages.

CHAPTER VIII

SUMMARY AND IMPLICATIONS OF THE FINDINGS

The general problem of this study as stated in the first chapter was to discover the scholastic progress of students in four colleges in the area of general education as measured by the Co-operative Achievement Tests and to discover the relationship of that progress to scholastic aptitude, to college courses taken, and, in one college, to the attainment of character objectives. The findings are summarized in the following paragraphs.

In the four colleges tested there is a general pattern of gain in scores from Freshman to Senior year with considerable variation in the separate colleges on particular tests.

Where comparable figures are available in the publications of the Co-operative Test Service, it is evident that the students in these colleges stand above the 50th percentile of the norms based on national distribution and that they gain slightly more from year to year than does the group of students upon which the national norms are based.

When the gains equal to or greater than two and one-half times the standard error of measurement alone are counted, the percentage of students in these colleges (the scores consolidated) who gain in the period from Freshman to Senior year ranges from 65 per cent for the test on Vocabulary to 34 per cent for the test on Fine Arts. Excessive gains and losses in one year tend to be followed by a compensating score the next year, so that the percentage of students gaining in the three-year period is usually larger than the percentage gaining in any single year.

The correlation coefficients for the relationship between Freshman and Senior scores range from $.81 \pm .01$ for Foreign Literature to $.71 \pm .02$ for Literary Acquaintance. To that extent, students hold their relative place as the group gains in score.

The correlation between scholastic aptitude test scores of Freshman week and co-operative test scores in May of the Freshman year ranges from $.74 \pm .02$ for English to $.40 \pm .07$ for Public

Affairs. Thus, there is a substantial relationship between scholastic aptitude and initial scores on the achievement tests.

The correlation between gains in co-operative test scores and scholastic aptitude range from $.23 \pm .09$ for Aesthetics to $-.07 \pm .04$ for English. When the students are divided into quartile groups by scholastic aptitude, each group tends to gain as much in score as every other group and about the same percentage of students gain in each group. Yet there is a vast difference in the initial scores and, therefore, in the final scores. Seldom do the Seniors in the lowest quarter in scholastic aptitude equal the Freshman test scores of students in the highest quarter.

The relationship between Freshman courses in English and gains in English Usage scores is apparently a direct one. The relationship between the number of semester hours in English literature and test scores in Literary Acquaintance is expressed by a correlation coefficient of $.52 \pm .06$ for students in College A and a coefficient of $.27 \pm .05$ for students in College B. For the sections of the General Culture Test, the relationship between courses and test scores varies from college to college. With the exceptions noted above, there is little positive correlation between courses taken in related fields in these colleges and the extent of the gains made in the tests. It is apparent that the gains in test scores of these students were not a function of the curriculum. In the opinion of the investigator, this is probably because items in most of the tests used do not parallel course content.

It is possible to construct a rating scale for character that is reasonably reliable and valid. The rating scale technique seems to be a useful one for institutions able and willing to describe character objectives in definite terms. The correlation between character rating and scholastic aptitude is $.17 \pm .08$. There is no significant positive correlation between the character rating score given to students and their Senior scores in the co-operative achievement tests. The only exception discovered is the relationship between character score and score on the Public Affairs section of the Contemporary Affairs Test. Even there the correlation coefficient is only $.37 \pm .09$. The correlation coefficients for character rating and gains in test scores are $.18 \pm .08$ or less. For the students in the one college in which the rating scale was used, then, intellectual achievement as far as

that is measured by the co-operative tests and the attainment of character values are not concomitant.

Limited case studies of students selected because of the atypical nature of their test performance revealed many factors that influence student achievement. Furthermore, it appears that such elements in student experience as vocational motivation, time spent in employment, physical health, emotional health, and time spent in extra-curricular activities are clearly weighted differently in importance for different individuals. The decisive factor in one student's experience may be a matter of indifference for another. The combination of such factors seems to be unique for each personality.

In conclusion, certain implications are suggested. Some of them are presented in the form of questions that merit further investigation.

1. The method of repeated testing of college students year by year by means of comparable forms of standardized tests offers a helpful means of evaluating student progress. It supplements rather than displaces teachers' marks in courses. A beginning in providing tests for such a purpose has been made by the Co-operative Test Service. However, these tests suffer certain limitations. In some fields, in view of the method of their preparation and their purpose, they do not parallel the material and emphasis of particular college courses. Yet, it would not be desirable educationally to have colleges alter courses for the purpose of paralleling the examinations. Furthermore, the tests, particularly the earlier forms, some of which were used in this investigation, are largely concerned with the recognition of factual items rather than with other objectives of learning. It is hopeful that objective tests are now being developed that are designed to measure the higher intellectual processes. These techniques of thinking are less subject to institutional curriculum patterns than is the mastery of factual material, and hence tests designed to measure on these levels of learning would tend to be valid measures in different institutions.¹ The repeated use of such tests to measure the intellectual progress of college stu-

¹Reference is made to the work of the Evaluation Staff of the Eight Year Study of the Progressive Education Association and to the research now being carried on by the Co-operative Study in General Education.

dents, together with the tests of the type used in this investigation, promises to be significant in student personnel work.

2. The present report gives additional emphasis to the findings of other investigations concerning the great individual variation of students within a single institution. It is clear that the college that would serve its students best must go as far as possible in individualizing its program.

3. The finding that the rate of progress as measured by the co-operative tests is typically not affected by scholastic aptitude has certain implications. Even the student of low aptitude does learn something. In fact, he gains as much in score quantitatively as his abler brother. To that extent, college benefits him. On the other hand, he seldom approaches even in his Senior year the Freshman score of the abler student. Does not this emphasize the importance of offering him a curriculum in which a minimum attainment will still give socially useful results? Should more difference be made in the instructional techniques for students at different aptitude levels? It would be interesting to learn whether there would be a greater differential in rate of progress if the tests measured the higher intellectual processes. Such an investigation would be possible with some of the newer types of tests.

4. In view of the importance of measuring the "intangibles," the development and administration of personality and character rating scales by colleges committed to an emphasis on character building seems to be desirable.

5. Since factors such as health, emotional stability, financial resources, etc., are particularly important for students of low scholastic aptitude, it is important that colleges intending to admit students from the lower quarters develop procedures to gather data from a larger area of the students' experience.

6. The final implication that will be suggested is that the educational responsibility of colleges such as these extends to concern for the entire personality. This includes character in the sense in which it has been set forth in this report. If, as the evidence submitted indicates, intellectual achievement and character achievement do not necessarily take place together, it is important that the college make provision to stimulate and to evaluate both. They must be recognized as separate, although not

mutually exclusive objectives, possibly requiring different methods of attainment.

In this connection, it is of interest to note that Dr. George F. Zook in his last annual report as president of the American Council on Education stressed the renewed demand for a religious emphasis in education and stated that the question of possible participation of the Council was under consideration.¹

It is hopeful that character as well as scholarship is becoming increasingly the concern of education. This promises to be one of the most fruitful fields of educational research.

¹George F. Zook, "The President's Annual Report," Educational Record, XXI (July, 1940), 259-334.

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APPENDIX I

The Construction of the Character Rating Scale

When the faculty of Aurora College undertook the construction of a Character Rating Scale, it was with an understanding that character is a term variously defined. After a study of the literature and of various scales and inventories that had been published, including the Manual for Behavior Description prepared by the Reports and Records Commission of the Commission of the Relation of School and College of the Progressive Education Association, the character and personality scale of J. B. Maller, and the publications of the Character Research Institute, it was decided to define the term character as used in this report as including the traits, attitudes, and behavior listed in the Character Rating Scale. It is recognized that this is an arbitrary limitation of the term and that no list so limited can include all the aspects of character. It did seem justifiable, however, to set up the several categories that were counted important by this particular faculty under the practical limitation that only items which could be scored with a reasonable degree of objectivity and certainty could be included. Even so, in the first form of the scale such an item as "Satisfactory personal worship experience," while considered a desirable objective, was found to be an item which could not be scored with a sufficient degree of certainty. In the final form of the test as given in the following pages, a number of such items have been omitted. Therefore, the scale is not to be considered as an even reasonably complete description as understood by this faculty, but rather a list of elements of character upon which it seemed possible for teachers to record valid judgments. The Manual of Instructions, as given to the faculty raters, and the Character Rating Scale follow. The Character Rating Score Sheet has been filled out for a high ranking and a low ranking student with ratings which were actually given.

Manual of Instructions for Aurora College
Character and Personality Rating Chart

General Directions:

In the fall of 1938 a committee of the faculty studied the matter of the objectives of Aurora College in the area of character and personality. Previous formulations of the faculty in this field and the published results of such studies elsewhere were considered.

As a result, the Character Objectives of Aurora College were expressed on a rating chart of five steps expressed in descriptive terms for seventy-one (71) different qualities, attitudes or types of behaviour grouped under the eight categories:

1. A Christian Philosophy of Life.
2. Desirable Social Relationships.
3. Satisfactory Emotional Adjustment.
4. An insight into the Nature and Application of Good Thinking.
5. Sound Health and Attractive Appearance
6. Effective Work Habits
7. Rewarding Leisure Time Interests and Skills
8. Sound Attitude toward Property

Thirteen members of the faculty were asked to rate a small number of Seniors of the class of 1939. This was done and the results studied from the standpoint of the usefulness of the rating chart as a measuring device. It was evident while some of the items were of little value that the chart did discriminate and that it was a useful device in determining the extent to which students had in the judgment of the faculty attained the objectives of the college.

The instrument presented herewith is a revision of that chart. Items for which faculty members reported no adequate basis for judgment have been dropped. Other items have been eliminated in an effort to reduce the size of the chart without impairing its usefulness. The result is a scale of forty (40) items of five (5) steps each grouped under seven (7) categories:

	Number of Items
1. Religious and Moral	8
2. Social	7
3. Emotional	5
4. Intellectual	5
5. Physical	4
6. Work Habits	6
7. Leisure Interests and Skills	<u>5</u>
	40

Each of these items is given five descriptive steps ranging from the least desirable to the most desirable and having a numerical value of 0,1,2,3,4 respectively.

The actual rating on each item is to be entered as a number in the appropriate square. Ratings of 0 or 1 or 2 should be entered without hesitation when the descriptions for those steps fit.

The ratings are to be entered on the Tabulation Blank next to the names of the students.

When there is no adequate basis upon which to rate a student on a particular item, a cross (x) should be made in that box.

When there is no basis for expressing any judgment upon a student, leave all the squares to the right of his name blank.

The results of rating scales are often affected by the writer's general opinion or prejudice about an individual which would cause him to mark consistently high or low, thus producing what is usually referred to as the halo effect. This defect will be reduced if the rater considers all individuals on one characteristic at a time, rather than each person on all characteristics. Thus, the individual is judged in relation to the other members of his group on each specific item.

The procedure then would be this:

Read carefully the descriptive steps under item No. 1, Christian faith; then with those descriptions before him, the rater would enter a score from 0,1,2,3, or 4 on the tabulation sheet for each of the 90 odd students listed. The rating should be that to which the student was entitled at the time he graduated from college, except for the members of the present Senior class which should be rated as of to-day.

The rater would then proceed to rate all students on the second item and so on through the forty items.

The task need not be completed at one sitting; it would be less tedious and probably the ratings would be more discriminating if the work were spread over several days.

Make your ratings without consultation with anyone. Independence of judgment is essential.

Base your judgments as far as possible on actual experience with the pupil's behavior. If for some items you have only a vague impression, enter a cross (x) instead of a rating. If for some items you feel justified in entering a rating but you are not as certain about the judgment as you are for most of the other items, enclose that rating number in a circle (3).

It is hoped that your co-operation will help us forward in the difficult task of understanding better our task in building character at Aurora College.

If these can be returned to the undersigned by January 10, 1940, that will be appreciated.

Thank you.

Theodore P. Stephens

Character and Personality Rating Chart

I. A Christian Philosophy of Life

- | | |
|--|---|
| 1. Professed Christian faith | 0 Opposed to all religious faith. |
| | 1 Unbelieving but open-minded. |
| | 2 Not clear about religious truth but reaching out. |
| | 3 Defines religion wholly in terms of Jesus as a personal ideal. |
| | 4. Accepts God as Father and Jesus as Savior and Lord |
| 2. Participation in public religious life | 0 Never attends church. |
| | 1 Attends church and religious meetings occasionally. |
| | 2 Attends church and religious meetings regularly. |
| | 3 Attends religious services and participates in a responsible way. |
| | 4 Very high degree of participation in service. A zealous worker. |
| 3. Concern for the social implications of Christianity | 0 Shows no interest. |
| | 1 Mildly interested when demanded by social group. |
| | 2 Interested in discussion of social implications of religion. |
| | 3 Active in promoting discussions of social implications of religion. |
| | 4 Unusually active on campus and off in application of social implications of religion. |
| 4. Moral discrimination | 0 Acts general from impulse or selfish viewpoint. |
| | 1 Acts infrequently in a manner evidencing moral discrimination. |
| | 2 Acts occasionally in a manner evidencing moral discrimination. |
| | 3 Acts frequently in a manner evidencing moral discrimination. |
| | 4 Acts generally in a manner evidencing moral discrimination. |
| 5. Kindness in judging others | 0 Cruel. |
| | 1 Harsh, thoughtless and unkind. |
| | 2 Ordinarily decent to others and aims at justice. |

- | | |
|--|--|
| 5. Kindness in
judging others
(Cont.) | 3 Puts oneself in others' place
in treatment of others.
Golden Rule. |
| | 4 Unusual consideration and
thoughtfulness. |
| 6. Tolerance | 0 Always intolerant. |
| | 1 Usually intolerant. |
| | 2 Usually tolerant. |
| | 3 Always tolerant. |
| | 4 Has real appreciation of others'
convictions. |
| 7. Courage to act
on convictions | 0 Always goes with the crowd. |
| | 1 Usually with crowd. Occasionally
on own. |
| | 2 Unpredictable. |
| | 3 Acts on own convictions in spite
of crowds. |
| | 4 Acts on own convictions at cost
of social prestige to a
marked degree. |
| 8. Life as an oppor-
tunity to be of
service | 0 Thinks only of himself. |
| | 1 Occasionally serves when con-
venient or profitable. |
| | 2 Willing to serve those who serve
him. |
| | 3 Willing to serve for recognition. |
| | 4 Life's highest fulfillment in
living for others. |

II. Desirable Social Relationships

- | | |
|-------------------------------------|--|
| 9. Friendliness | 0 A solitary person. |
| | 1 Few casual friends. |
| | 2 Some friends, a few close. |
| | 3 A friendly person. |
| | 4 An unusually friendly person. |
| 10. Attitude toward
opposite sex | 0 Altogether too free--undesirable. |
| | 1 Sometimes over forward. |
| | 2 Conduct somewhat unpredictable. |
| | 3 Wholesome. |
| | 4 Desirable and ennobling. |
| 11. Social etiquette | 0 Often offends in simplest mat-
ters of etiquette. |
| | 1 Shows little appreciation of ac-
cepted rules of etiquette. |
| | 2 Usually does the reasonable
thing. |
| | 3 Blunders only on rare occasions
and then learns quickly. |
| | 4 Socially correct and at ease. |

- | | |
|----------------------------|--|
| 12. Sportsmanship | 0 A poor loser and apt to take unfair advantage.
1 Given to undesirable emotional outbursts in competition.
2 Usually exhibits good sportsmanship.
3 Can fight hard and still be sporting.
4 Always a good sport in victory or defeat. |
| 13. Ability to lead | 0 Never tries to lead.
1 Tries at times; usually fails.
2 Leads well in minor affairs.
3 Leads well in major affairs.
4 An unusually inspiring leader. |
| 14. Appreciation of favors | 0 Feels he never receives his due.
1 Takes all favors for granted.
2 Appreciative at times.
3 Usually shows appreciation.
4 Shows an unusual degree of appreciation. |
| 15. A desire to serve | 0 Seems concerned only with self; never serves.
1 Serves with reluctance when compelled to.
2 Ready to help when it is the thing to do.
3 Eager to serve.
4 Always looking for ways to be of help to others at any cost to self. |

III. Satisfactory Emotional Adjustment

- | | |
|---------------------------------|--|
| 16. Adequate emotional life | 0 Unawakened or completely repressed.
1 Very little emotional response.
2 Fairly adequate emotional expression.
3 Evidence of rich emotional experience.
4 Evidence unusually vivid and satisfying emotional life. |
| 17. Disciplined emotions | 0 No attempt to control emotions.
1 Emotions often uncontrolled.
2 Reasonably well controlled.
3 Well controlled.
4 Exceptionally well controlled. |
| 18. Ability to stand up to life | 0 Always whining and trying to escape and blame others.
1 Often whining and offering alibis.
2 Sometimes alibis.
3 Takes life's knocks without being sorry for oneself. |

- | | |
|--|---|
| 18. Ability to stand up to life
(Cont.) | 4 Unusually courageous in facing reality. Can take it. |
| 19. Enthusiasm | 0 Apathetic.
1 Usually unresponsive to new interests.
2 Usually responsive.
3 Responds eagerly.
4 Genuine and deep enthusiasm. |
| 20. Fair self rating | 0 Distinct inferiority complex or distinct superiority complex.
1 Low estimate of own ability or boastful.
2 Uncertain in estimate of self.
3 Fairly estimates capacities.
4 Unusually fair degree of confidence yet not over esteem. |

IV. Insight into the Nature and Application of Good Thinking

- | | |
|---|--|
| 21. Sound judgment | 0 Snap judgments based on prejudice.
1 Judgments colored by prejudice with some rationalization.
2 Judgments erratic.
3 Judgments usually based on facts. A few blind spots.
4 Calm judgments based on available facts. |
| 22. Curiosity--
Interest in
information | 0 Shows no curiosity in any field.
1 Slight interest in some fields.
2 Moderately interested in some fields.
3 Definite interest in some fields.
4 Real curiosity in many fields. |
| 23. Discrimination--
Ability to distinguish truth
from propaganda | 0 Affirms as fact some account highly emotional in its wording.
1 Accepts as fact the most obvious newspaper opinion or similar biased information.
2 Seems to have information in some area but gullible in others.
3 Weighs cautiously his assertions with a few exceptions and bases them on reliable information.
4 Weighs carefully all his assertions and does not affirm until he has reliable information. |

24. Understanding the unity of knowledge
- 0 A mind with air-tight compartments.
 - 1 A mind with some areas that intelligence does not apply to.
 - 2 A recognition of the unity of truth but seems to find it difficult to apply it.
 - 3 Well integrated mind with recognition of several problem areas.
 - 4 Able to integrate his knowledge and convictions in all spheres.
25. An appreciation of the significance of scientific method
- 0 Openly hostile to science and its results.
 - 1 Indifferent to scientific procedure. Hostile to some of its results.
 - 2 Mildly interested in scientific methods and accepts results.
 - 3 Genuinely interested in scientific methods with appreciation of its benefits.
 - 4 Uses scientific procedure in his thinking and accepts results with insight into limitations.

V. Sound Health and Attractive Appearance

26. Physical vitality
- 0 Definitely low; serious handicap.
 - 1 Irregular; must use caution.
 - 2 Average.
 - 3 Definitely high.
 - 4 Unusual vigor.
27. Cleanliness (grooming)
- 0 Slovenly.
 - 1 Often careless.
 - 2 Seldom careless.
 - 3 Well groomed.
 - 4 Unusually well groomed.
28. Freedom from sickness
- 0 Very frequently sick.
 - 1 Often sick.
 - 2 Seldom sick.
 - 3 Rarely sick.
 - 4 Never sick.
29. Sound attitude toward recreation in relation to health
- 0 No concern whatever.
 - 1 Inadequate provision for recreation.
 - 2 Some provision for recreation.
 - 3 Good provision for recreation.
 - 4 Carefully planned and thoroughly enjoyed. Adequate recreation.

VI. Effective Work Habits

- | | |
|---|--|
| 30. Use of time | 0 Uses time very carelessly.
1 Frequently uses time to poor advantage.
2 No system but does not waste much time.
3 Generally effective and systematic in use of time.
4 Exceptionally effective in use of time. |
| 31. Accuracy | 0 Usually slovenly and careless.
1 Frequently careless.
2 Occasionally careless.
3 Neat and accurate.
4 Painstakingly careful and accurate in form and substance. |
| 32. Initiative | 0 Needs constant pressure.
1 Needs occasional prodding.
2 Does regular assignments.
3 Does additional suggested work.
4 Devises and carries out original tasks. |
| 33. Persistence | 0 Very easily dissuaded from task.
1 Frequently drops task without good reason.
2 Sometimes fails to carry through.
3 Completes tasks when difficult.
4 No obstacle too great to prevent completion of task. |
| 34. Pride in fine work
(physical activities) | 0 Always assumes that anything that will get by is good enough.
1 Frequently slights the hidden features.
2 Usually tries to do a good job.
3 Always tries to do a good job.
4 Knows the joy and exacting demands of a fine craftsman. |
| 35. Full use of capacities | 0 Half asleep most of the time.
1 Never works to his limit.
2 Works well but does not stretch himself.
3 Works to limit occasionally.
4 Makes full use of his capacities most of time. |
| 36. Willingness to accept responsibility | 0 Always dodges responsibility.
1 Evades responsibility when possible.
2 Accepts responsibility without enthusiasm.
3 Welcomes responsibility within his powers. |

36. Willingness to
accept
responsibility
(Cont.)

4 Welcomes responsibility that
challenges his powers.

VII. Rewarding Leisure Time Interests and Skills

37. Discrimination in
choosing amuse-
ments (type,
time, expense)

0 Always chooses unsuitable amuse-
ments and encourages others
to do so.
1 Usually chooses unsuitable
amusements.
2 Rather indiscriminate in choice
of amusements.
3 Usually chooses suitable amuse-
ments.
4 Always chooses suitable amuse-
ments and encourages others
to do so.

38. Skill and interests
in sports that
will be available
after college

0 No interest or skill in sports
available after college.
1 Little interest in sports.
2 Moderate interest and skill in
sports.
3 Has interest and skill in at
least one sport available
after college.
4 Has interest and skill in sev-
eral sports available after
college.

39. Real appreciation
of art, music,
drama, nature,
etc.

0 No interest in art, music,
drama, nature. Ridicules
those who enjoy beauty.
1 Little interest in art, music,
drama, nature.
2 Mild interest in beautiful
things but does little about
it.
3 Definite interest in at least
one branch of art and appre-
ciation of other branches.
4 Enthusiastic interest in art,
music, drama, and nature.
Enlists others.

40. Love of reading
(level, amount)

0 Does not like to read. Ridi-
cules those who do.
1 Usually chooses trashy reading.
2 Mild interest in good books.
Does not read many.
3 Definite interest in good books.
Reads several books each year.
4 Always chooses good books.
Reads a great deal and encour-
ages others to read.

